Cardialogue

cardialogue

joint consultation of general practitioners and cardiologists in a primary care setting

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contents

chapter 1

introduction and

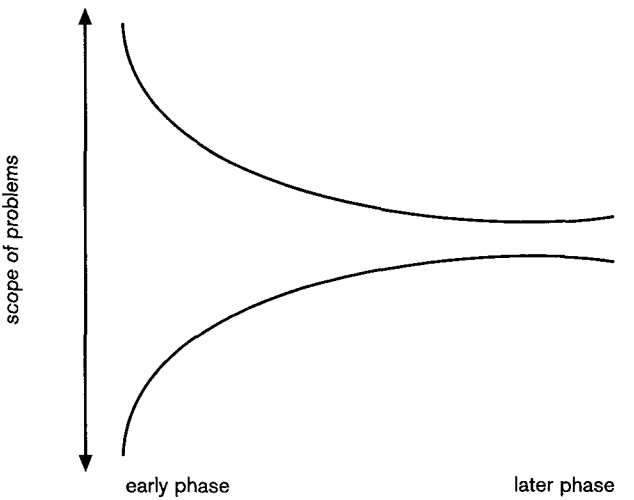
research questions of the project

introduction The general practitioner (GP) is the gate-keeper in the Dutch health care system. As such, his main task is to see that suitable care is provided for his patients (1). This implies that it is the GP's task to ensure that the right care is provided at the right place (2). Several factors determine the success of the task, and they are discussed in the following section. They lead on to the problem and research questions investigated in the research project 'Joint Consultation of general practitioner and cardiologist'.

diagnostic uncertainty and differences in the way of working between GPs and specialists

The GP is operating in a complex field: he has to handle the broad scale of cases presented in daily practice, using the medical history and physical examination to reach a working hypothesis. It is also essential to use contextual data during the diagnostic process (3).
The GP's setting can be characterised by the vast scope of problems in the early phase of the course of complaints especially, see figure 1.1 (5)

figure 1.1. **the scope of problems in the early (mostly GP's) phase is vast, in a later phase smaller**



By using a methodological approach, the GP finds the direction for the process of care based on an initial diagnostic structuring that matches the complexity of the specific patient's situation (4-5) and that enables him to deal with 90% of the presented morbidity on his own (6). The GP is guided by the assessment of the prior probability of the diagnoses considered, by the severity and prognosis, and by the assessment of the consequences of his management (5). The GP

refers about 15% of the cases he meets in his practice to the specialist who will have to deal with a highly selected group of patients (5).

This broadly defines the differences between the working methods of GPs and specialists. The specialist has to deal with a patient population in which the predictive value of diagnostic examination and the prior possibility of illness are much higher (7-8). The GP's working methods are based on the hypothesis that there is less room for extensive routine diagnostic procedures, whereas the specialist's working method is driven by an algorithm that brings in maximal certainty (9). The GP will have to accept some diagnostic uncertainty, which generally will apply in about 15% of cases (6). The GP has the disposal of a small arsenal of additional tests to ensure diagnostic certainty, but these are used sparingly by the Dutch GP (10). The need for additional testing is great in the case of vague complaints. One may suppose that diagnostic testing can reassure a patient with vague complaints (11-12), but it is known that additional testing provides only a marginal increase in the certainty when there is a small prior possibility of illness (11). That is why a restrained attitude is necessary in those cases (13).

This holds for cardiac complaints too. Chest pain, the most incident of all possibly heart-related complaints, is characterised by diagnostic uncertainty in about 30% of the cases (6,14). In acute situations with more specific complaints (possibly indicating unstable angina pectoris or myocardial infarction), this certainty is greater: about 90%. To differentiate between 'cardiac chest pain' and 'non-cardiac chest pain' an electrocardiogram (ECG) at rest will often be made (15-16). The prospective value of an ECG at rest is small, and therefore in diagnosing chest pain, a test with little value. The GP will be better supported by using incidence data of his practice population and patient's contextual data when there is doubt about whether the patient is ill or not (17).

In some experiments the GP could send patients directly for additional tests like exercise and 24-hour electrocardiography, and echocardiography (18-20). The results seem to be good with regard to the diagnostic efficiency achieved and to the reduction of unnecessary referrals to secondary care. Nevertheless some remarks have to be made. It has been reported that GPs sometimes used the tests to exclude some disorders like coronary heart disease for patients who were at low risk (19). The prospective value of an exercise ECG for this category is low (21). The same can be said for the echocardiogram when this is requested for patients who are not yet being treated for possible heart failure, as shown in a British study: in only 8% of the cases could heart failure

be diagnosed, while the results in a selected patients' group who were already been treated were much better: in 26% of the cases a systolic dysfunction could be found (22). In this investigation it was not possible to assess the systolic function in more than 40% of the cases, among other reasons because of patient's obesity.
These studies reveal a category of patients for whom the additional testing is not that helpful to reach a diagnosis, a finding that cannot simply be justified as 'Well, it was worth a try' (19).
So it is questionable whether it is helpful to give the GP even more tests to reduce his diagnostic uncertainty in order to reach the desired improvement in efficiency. Nevertheless, the GP will clearly have to achieve a better selection of patients in order to increase the predictive value of diagnostic tests. The question then is how to achieve that objective.

referrals and health care efficiency

Another strategy available to the GP when he is uncertain about the diagnosis of his patients is to refer them. More than 40% of referrals of patients with problems of the circulatory tract are for diagnostic reasons; for other tracts this percentage is lower (23). Diagnostic uncertainty is an important variable in deciding to refer a patient for some specific categories of complaints and diagnoses (14). Quite a number of referrals, up to 30%, seem to be unnecessary, as has been found in some studies, taking into account all reasons for referral like patient's anxiety and GP's defensive reasons (24-27). Grundmeijer and van Weert concluded that referring anxious patients and patients with vague complaints to an internist was the least beneficial. In their study observers (GPs and internists) found that the GP's diagnostic process was insufficient in almost 50% of the cases referred and that some of them would not have to be referred if the diagnostic process had been more thorough (25). One may expect that a direct, clear question to the specialist would improve the efficiency of a referral. In daily practice this is often not the case. Generally, the GP's query frequently lacks precision with the consequence that there is little agreement between the intention (mostly not explicit) of the GP and the care of the specialist who has carte blanche. But even in those cases where the GP stated explicitly his intentions, the specialist did more than the GP asked him to

do (28). That the referral process did not influence the referral's outcome was a remarkable finding (28). Moreover, Kersten found that GPs had less influence on the specialist care for their referred patients than they would have liked. He distinguishes influence through continuity from influence through selection, and concludes that when GPs give up their influence through continuity, there only remains selection (of patients to refer) to affect what happens in secondary care (29). Clearly, in trying to improve the efficiency of health care, more attention should be paid to the selection and decision-making process of the GP.

mutual ignorance of working methods

The differences between the tasks and working methods of GPs and specialists make a direct influence on each other's work quite impossible, and maybe even undesirable. Their working methods cannot be exchanged, for they are complementary (30). Optimal efficiency is hindered by the specialist's ignorance of the GP's work (31). Just as the GP thinks that the specialist is doing more than is desirable, so the specialist believes that the GP is referring fewer patients than the specialist finds necessary (32).
In this connection it is remarkable that the number of repeated referrals concerning the circulatory tract is higher than for any other tract (23). Possibly, when there is uncertainty about heart complaints, the GP and the patient quickly opt for referral to a cardiologist, who is apt to continue his monitoring of some patient categories even when no serious problems are concerned any more (33). This will be influenced by the fact that the specialists are confronted with great variation in the quality of GPs' performance (31). These patterns of practice may be expected to lead to capacity problems in secondary, cardiological care in the near future, as the need for care grows because of the decreasing number of patients who die in an early stage of heart disease and because of the increasing number of the elderly patients (34). Both the GP and the cardiologist will have to prepare themselves and together will have to develop strategies to deal with this expected growth of cardiological care.
With the view to strengthening primary care, it is necessary to intensify the collaboration between GP and cardiologist in order to better attune working

methods between primary and secondary care (9). Better communication and better working relations are not the main objectives (26), but they are conditions required for the working methods to be better attuned. The goal, then, is to seek methods to achieve operational complementarity to be able to break away from the structure of echelons (30).

So far we have outlined the following problems:

- because of diagnostic uncertainty it is a problem for the GP to fulfill his role as gate-keeper in a health care system that entails efficient selection of patients he can treat himself and patients who have to be referred to the specialist.
- the number of unnecessary referrals can be reduced if the GP increases his diagnostic certainty and thus improves the selection of patients to be referred.
- unless optimal selection is achieved, free access to additional specialist test procedures does not seem to be a proper solution.
- in view of the differences in GPs' and specialists' working methods, efficient substitution of care will only be achieved when these working methods are better attuned.
- methods have to be developed which focus the complementary character of the working styles of GPs and specialists.

joint consultation of GP and specialist: a solution?

Joint consultation sessions of GPs and specialists can make a fundamental contribution to resolve the problems outlined. The joint consultation method is a series of consultation meetings of a GP or a small group of GPs with a specialist-consultant in the presence of the patient. The meetings are held in the surgery of one of the participating GPs. A joint consultation can be used when the GP is not certain about the diagnosis or treatment of a patient.
The objective is to give the GP the tools to continue with his patient himself. In this way the GP keeps the responsibility for the patient's care himself in principle; nevertheless the GP and specialist can decide during a session that the patient should be referred to secondary care.
The main objectives of the joint consultation are: a proper care for the patient,

growth in knowledge of the GP, prevention of unnecessary referrals, improvement of communication and collaboration between GP and specialist (35). Vierhout et al. demonstrated that these objectives can be achieved. His randomised experiment studied the effects of joint consultations for patients with complaints of the locomotor system: efficiency improvement and cost reduction have become feasible (36,37). The participating GPs appreciated the joint consultation method very much, and specifically the medical education effect, a finding in line with other studies (38). The joint consultation method satisfies Harden's criteria of effective education: convenience, relevance, individualisation, self assessment, interest, speculation and systematisation (39). Freeman too pleaded for more discussion about patient-related cases in primary care (40): the joint consultation fits with these ideas.
The joint consultation is one form of structured, small-scale deliberation that is appropriate to improve the collaboration between GPs and specialists (41). Experiences with other consultation methods have been reported such as the structured telephonic consultation (42) and deliberation in absence of the patient (43). The joint consultation model we describe is especially distinguished by the presence of the patients who mostly are very satisfied with the method and its results. The same can be concluded when only the GP of the patient in question participates in the consultation sessions (44). The benefits of the group model concern the medical education effects that benefit more GPs.
For complaints of the locomotor system the joint consultation was an effective method. It is not sure whether this is also the case for complaints and disorders of other tracts. That is why further research has been recommended (36,45). In this thesis we report the findings of a study of the effects of joint consultation sessions for patients with (possible) cardiac complaints and disorders. We used the same research methods that had been used in the joint consultation study for orthopaedic complaints in order to be able to make a comparison.
We selected cardiac complaints because of the diagnostic and therapeutic problems the GPs meet in daily practice, as has been described above. The specific referral pattern with many repeated referrals seems partly to be due to this view. The question is whether the joint consultation can contribute to a better selection of patients, as described above. The research project 'The joint consultation of general practitioner and specialist in general practice for patients with cardiac complaints' was set up to answer this question.

research questions

1 What is the nature and quantity of the cardiac problems the GP has to deal with in daily practice and to what extent does diagnostic uncertainty influence the GP's performance?
2 What is the effectiveness of joint consultation sessions of GPs and cardiologists in general practice on the care of the patient and his state of health, and how do the patients appreciate the sessions?
3 Does participation in joint consultation sessions lead to growth of GP's knowledge?
4 What are the goals of GPs and cardiologists to participate joint consultation sessions in general practice, have they been achieved, and what are the experiences of the GPs and cardiologists?
5 To what extent do the patients with non-acute cardiac complaints who are referred directly to the out-patient clinic differ from those who are selected for the joint consultation, and has there been an optimal use of the joint consultation?
6 Does participation in joint consultation sessions achieve a reduction of the number of cardiac referrals, and does this lead to a reduction of costs?
7 Is the joint consultation of GP and specialist in general practice a feasible method?

Each of these questions is dealt with in a separate chapter of the thesis.

structure of the thesis

Chapter 1 describes the reasons underlying the project and the research questions.
Cardiac morbidity in general practice and the influence of GP's diagnostic uncertainty on his referral pattern, that is research question 1, is discussed in **chapter 2.**
In **chapter 3** the research design and methods of the project are described, as well the research variables and the base line data of the patients, GPs and cardiologists.
Chapter 4 'Effectiveness of joint consultation sessions of general practitioners

and cardiologists in a primary care setting: a randomised controlled trial', presents the findings of the study that answers question 2.
In **chapter 5** entitled 'Joint consultation as a method of continuing medical education and professional development', the results are described of a separate study of the effects of joint consultation sessions on the knowledge of the participating GPs.
Research question 4 is the subject of **chapter 6**, which is concerned with the motives and objectives of the GPs and cardiologists to participate in joint consultation and their perceptions.
Chapter 7 'Patients referred to the cardiologist versus patients selected for a joint consultation: are there differences?', gives the results of a study of the overlap between patients who have been referred directly to the out-patient clinic and patients who are selected for a joint consultation to see whether an optimal substitution effect could be achieved. This chapter concerns question 5.
Chapter 8 deals with 'Decreasing trends in referrals and costs for patients with coronary heart disease as a result of joint consultations', thus providing answers to question 6.
The feasibility has been studied in an implementation project that is described in **chapter 9**, entitled 'The joint consultation carrousel: from experiment to regular service'. This treats question 7.
Chapter 10 presents the general discussion, including recommendations for the care system, further research, and the impact of joint consultation for continuing medical education.
Finally **chapter 11** closes the thesis with a summary of the whole project.

references

1 Bosch WJHM van den
Huisarts en poortwachter [GP as gatekeeper]
Ned Tijdschr Geneeskd 1994;138:2646-9

2 Meyboom- de Jong B
De huisarts als poortwachter. Verslag van tijdschriftconferentie [GP as gatekeeper. *Report of Journal's Conference*]
Ned Tijdschr Geneeskd 1994;138:2668-73

3 Hobus P
Expertise van huisartsen [GP's expertise]
[Proefschrift] [Thesis] Maastricht: University Maastricht, 1994

4 Weel C van
Achilles tot hardloper bekeerd. Over het terugdringen van vrijblijvendheid in de huisartsgeneeskunde [Converting Achilles into a jogger. Corralling the freedom of action in family practice]
Huisarts Wet 1981;24:417-23

5 Knottnerus JA, Grinten R van
Huisarts en Epidemiologie. Practicum Huisartsgenees-kunde [GP and epidemiology]
Wetenschappelijke Uitgeverij Bunge, Utrecht 1994

6 Lamberts H
In het huis van de huisarts. Verslag van het Transitieproject [In the house of the GP. Report of the Transition project]
Meditekst Lelystad, 1991

7 Knottnerus JA
Interpretatie van diagnostische gegevens. Een onontgonnen terrein in de huisartsgeneeskunde [Interpretation of diagnostic data. An undeveloped area in primary care]
Huisarts Wet 1993;26:363-8

Also published as:
Knottnerus JA
Interpretation of diagnostic data. An unexplored field in general practice
J R Coll Gen Pract 1985;35:270-4.

8 Velden HGM van der
Diagnose of prognose. De betekenis van de epidemiologie voor het handelen van de huisarts [Diagnosis or prognosis. The meaning of the epidemiology for the GP's performance]
Huisarts Wet 1993;26:125-8

9 Everwijn SEM, Melker RA de
De werkwijze van huisarts en specialist [Working methods of GPs and specialists]
Huisarts Wet 1995;28:302-6

10 Boven C van, Dijksterhuis PH
De schatbare waarde van aanvullend onderzoek in de huisartspraktijk [The value of laboratory tests and diagnostic imaging in general practice]
[Proefschrift] [Thesis] Amsterdam: University of Amsterdam,1993

11 Zaat J
De macht der gewoonte [The force of habit]
[Proefschrift] [Thesis] Amsterdam: Free University,1991

12 Melker RA de
Kiezen en delen met de trechter van Dunning [Choosing and sharing in Dunning's funnel]
Medisch Contact 1995;50:642-3

13 Melker RA de
Diagnostische faciliteiten voor de huisarts: wie wordt er beter van? [Diagnostic facilities for the GP: who is getting better?]
Huisarts Wet 1993;26:184-8

14 Vlek JFM, Esch HWMJ van, Verest LFHM, Vierhout WPM, Crebolder HFJM
Cardiale problemen in de huisartspraktijk: een inventarisatie [Cardiac problems in general practice: an inventory]
Hartbulletin 1997;28:55-9

15 Tillema W, Holtkamp HA
Het Cardiofonieproject Zwolle [The cardiophony project Zwolle]
Huisarts Wet 183;26:132-5

16 Klinkman MS, Stevens D, Gorenflo DW
Episodes of care for chest pain: a preliminary report from Mirnet
J Fam Pract 1994;38:345-52

17 Meyboom WA
De beperkingen van cardiofonie [The limitations of cardiophony]
Huisarts Wet 193;26:136-9

18 Remkes PAJ, Thomas K, Bongers FJM, Kluivert EP de
Cardiale diagnostiek door de huisarts in samenwerking met de cardioloog [Cardiac diagnostics by the GP in collaboration with the cardiologist]
Medisch Contact 1994;29:574-6

19 Remkes PAJ, Nijs HGT, Kluiver EP de, Casparie AF, Bongers FJM
Vrije toegang tot inspanningselectrocardio-grafie met aansluitend cardiologisch advies en feedback aan de huisarts: gunstige invloed op het verwijspatroon [Open access to exercise electrocardiography with cardiologic advice and feedback by the cardiologist: favourable influence on referral pattern]
Ned Tijdschr Geneeskd 1996;140:1596-9

20 Murphy JJ, Frain JPJ, Ramesh P, Sidiqui RN, Bossingham CM
Free access echocardio-graphy to general practitioners for suspected heart failure
Br J Gen Pract 1996;46:475-6

21 Anonymous
A report of a working group of the BCS: cardiology in the district hospital
Br Heart J 1994;72:303-8

22 Francis CM, Caruana L, Kearney P, Love M, Sutherland GR, Strakey IR, Shaw TRD, McMurray JJV
Open access echocardiography in management of heart failure in the community
BMJ 1995;310:634-6

23 **Rapportage LINH: Landelijk Informatie Netwerk Huisartsenzorg [Reports of LINH: the National Information Network of General Practice]**
Utrecht,1995

24 Jenkins RM
Quality of general practitioners referrals to outpatient departments: assessment by specialist and general practitioner
Br J Gen Pract 1993;43:111-3

25 Grundmeijer H, Weert H van
Patient, huisarts, internist [Patient, GP, internist]
[Proefschrift] [Thesis] Amsterdam: University of Amsterdam, 1992

26 Engelsman C, Geertsema A
De kwaliteit van verwijzingen [The quality of referral]
[Proefschrift] [Thesis] Groningen: University of Groningen, 1994.

27 Krol LJ
De consument als leidend voorwerp in de gezondheidszorg [The consumer as direct object in health care]
[Proefschrift] [Thesis] Amsterdam: University of Amsterdam, 1985

28 Geertsema A, Engelsman C, Haaijer-Ruskamp FM
Overeenstemming van specialistische zorg en de bedoeling van de huisarts bij verwijzing van patienten [Agreement between specialist care and the purposes of the GP at referral of the patient]
Ned Tijdschr Geneeskd 1992;136:1107-11

29 Kersten TJJMT
De invloed van huisartsen in de tweede lijn [The influence of the GP in secondary care]
[Proefschrift] [Thesis] Utrecht: State University Utrecht,1991

30 Lamberts H
Huisarts en specialist: complementair of substitutie? [GP and specialist: complementary or substitution?]
Tijdschr Sociale Gezondheidszorg 1987;65:828-32

31 Jacobs HM, Melker RA de, Hell RJ van der
Wat weten specialisten van het werk van de huisarts? [What do the specialists know about the GPs' work?]
Huisarts Wet 1990;33:152-6

32 Lamberts H
Protocollen, normen en waarden. Redactioneel Commentaar [Protocols, standards and values. Editorial Commentary]
Huisarts Wet 1983;26:122-4

33 Vlek JFM, Buntinx F, Crebolder HFJM, Ree JW van
De rol van de huisarts bij de begleiding van patiënten na een myocardinfarct [The role of the GP in managing patients after their myocardial infarction]
Ned Tijdschr Geneeskd 1994;118:2049-53

34 Bonneux L, Barendrecht JJ, Meeter K
De toekomst van hartziekten in Nederland: dalende sterfte en stijgende zorgbehoefte [The future of heart diseases in the Netherlands: decreasing mortality and increasing need of care]
Ned Tijdschr Geneeskd 1994;138:1612-18

35 Vlek JFM, Vierhout WPM, Pop P
Het gezamenlijk consult huisarts-specialist in de huisartspraktijk [The joint consultation of GP and specialist in general practice]
Tijdschr Huisartsgeneeskd 1997; 14:15-20

36 Vierhout WPM
Het gezamenlijk consult huisarts-specialist in de eerste lijn [The joint consultation of GP and specialist in primary care]
[Proefschrift] [Thesis] Maastricht, University Maastricht, 1994

37 Vierhout WPM, Knottnerus JA, Ooij A van, Crebolder HFJM, Beusmans GHMI, Pop P, Wesselingh-Megens AMK
Effectiveness of joint consultation sessions of general practitioners and orthopaedic surgeons for locomotor system disorders
Lancet 1995;346:990-4

38 Schuurman W, Everdingen JJE van, Schadé E
De dermatoloog in de eerste lijn. Verslag van een nascholingsproject [The dermatologist in primary care. Reports of a medical education project]
Huisarts Wet 1992;35:161-3

39 Harden RM, Laidlaw JM
Effective continuing education: the CRISIS criteria
Med Educ 1992;26:408-22

40 Freeman TR
The patient centered Case Presentation
Family Practice 1994;11:164-9

41 Have J ten, Buwalde J
Hoe het beter kan tussen huisarts en specialist. Een methode voor kleinschalig overleg [Improving communication between general practitioners and specialists. A method for small scale deliberation]
Medisch Contact 1990;45:86-7

42 Pop P, Beusmans GHMI
Telefonische consultatie als diagnostisch hulpmiddel [Consultation by phone as diagnostic tool]
Practitioner 1990;635-8

43 Smit DJ de, Nagelkerke AF, Baan S van der
Ervaringen met consultatiebijeenkomsten [Experiences with consultation sessions]
Medisch Contact 1990;45:1413-15

44 Boer F den, Hageman GCHA, Waal MWM de, Petri H
Het gezamenlijk consult in de eerste lijn. Een alternatief voor verwijzen naar de tweede lijn? [The joint consultation in primary care. An alternative for referral to secondary care?]
Medisch Contact 1996;51:221-3

45 Orton P
Caring and sharing. Commentary
Lancet 1995;346:984

chapter 2

diagnostic uncertainty as to cardiac problems in primary care. information from general practice data bases

abstract

background Cardiac diseases form a hurdle for the GP, among other reasons because they have a high prevalence and high mortality rate.

objectives To investigate the number and kind of cardiac complaints and disorders the GP meets in practice, the extent of diagnostic uncertainty, and the number of referrals to cardiologists.

methods Data were collected from the Morbidity Registration from General Practice, the Transition Project and the National Morbidity and Intervention Study in general practice.

results Of all reasons for encounter (RFE) about 12% concern the circulatory tract leading in 25% of the cases to a cardiac diagnosis. In 25% to 33% of the cases the final diagnosis is symptomatic. Ischaemic heart disease is the most prevalent: about 18 patients/1000/year. The prevalence of heart failure and rhythm disorders is slightly more than 10 patients/1000/year each. Final diagnostic certainty can be reached in about 80% to 90% of the cases, while 10% to 28% of all patients are referred depending on the diagnosis. Diagnostic uncertainty almost doubles the chance to be referred.

conclusion Complaints of the heart are important reasons for encounter. The prevalence of cardiac diseases is high; so is the referral rate, which to a high degree is dependent on diagnostic uncertainty. These aspects require the GP to devote much attention to the management of these disorders and to collaboration with the cardiologist.

keywords Cardiac disorders, incidence, prevalence, general practice.

introduction As cardiac problems seem to be a hurdle for the GP, the joint consultation project for cardiac problems was developed. The hurdle seems higher too because diseases of the heart have a strong emotional value, illustrated by the many proverbs involving the heart. Mortality rates show that heart diseases still are the major cause of death in the Dutch population (1). The prevalence of diseases of the circulatory tract is one of the highest on the list of prevalent diseases (2).

At the start of the joint consultation project we wanted to know the number and kind of cardiac complaints and disorders individual GPs meet in

practice, the extent of GPs' diagnostic uncertainty, and how often they have to refer their patients to cardiologists.

methods

To answer these questions, we used data from several sources: the Morbidity Registration from General Practice (Continue Morbiditeitsregistratie, CMR) (2), the Transition Project (het Transitieproject) (3) and the National Morbidity and Intervention Study in General Practice (Nationale Studie naar ziekten en verrichtingen in de huisartspraktijk) (4). These data will be compared with data from registration projects in the province in the Netherlands in which the joint consultation was carried out (5,6).
An explanatory list of terms used is presented in an appendix at the end of this chapter.

results

cardiac reasons for encounter and episodes in general practice

Of all reasons for encounter (RFE), about 12% concerned the circulatory tract (3), the third most common RFE after the tractus locomotorius (more than 15%) and the respiratory tract (12.5%).
The incidence of episodes of the circulatory tract is rather low, only the seventh most common with 3.5 (4) to 5% (3) of all episodes.
In the National Study the prevalence of circulatory tract episodes is the third highest with about 12% of all episodes (4), while in the Transition project the prevalence was even the highest with 20% of all episodes. To put this in perspective, it is important to know that 28% of all circulatory tract episodes are attributed to uncomplicated hypertension (3). In the classification of all circulatory tract episodes, ischaemic heart disease, heart failure and atrial fibrillation hold the second, third and fourth places respectively.

from RFE to diagnosis

If one excludes all RFEs concerning hypertension, there are three main groups

of possible cardiac RFEs at the beginning of an episode: dyspnoea (26.9/1000 patients), chest pain (19.4/1000 patients) and complaints about heart rhythm (8/1000 patients). Several categories of final diagnoses are shown in table 2.1.

table 2.1. the categories of final diagnoses in relation to the main cardiac complaints at the beginning of an episode (3)

	cardiac disorder %	symptomatic code %	fear (for cardiac disease incl. HVS* %	diagnosis other tract or no disease %
dyspnoea: R02 n = 2506	12	9	9	70**
chest pain: K01+ K02 n = 1811	27	28	18	27
rhythm: K04 + K05 n = 801	24	37	12	27

* HVS = hyperventilation syndrome

** 70% = 67% diagnoses respiratory tract + 3% no disease or diagnosis other tract

The small number of final cardiac diagnoses and the relatively large number of diagnoses with a symptomatic code are striking: this means that the RFEs are not very specific and that there must be diagnostic uncertainty.
Of all patients presenting with the RFE dyspnoea, 8.9% had heart failure as final diagnosis; of the patients presenting with chest pain, 26% had ischaemic heart disease; and of the patients with complaints of the heart rhythm, 5.8% had atrial fibrillation and 17.7% paroxysmal tachycardia or extrasystolia.

In table 2.2 the incidence and prevalence of the main diagnoses (ischaemic heart disease, heart failure, atrial fibrillation, paroxysmal rhythm disorder) are shown.

incidence and prevalence of episodes of the main cardiac disorders (3) **table 2.2.**

diagnosis number	incidence total episodes /	incidence certain episodes	prevalence total episodes	prevalence certain episodes
	1000 patients/year			
ischaemic heart disease n = 1762	7.7	5.5	18.9	15.8
heart failure n = 1091	6.0	5.0	11.7	10.2
atrial fibrillation n = 460	2.1	1.9	4.9	4.7
extrasystolia + paroxysmal tachycardia n = 534	3.4	2.7	5.7	5.0

In Limburg the prevalence of all disorders mentioned in table 2.2 was higher: ischaemic heart disease 19.6 patients/1000/year, heart failure 11.1/1000, atrial fibrillation 15.4/1000, extrasystolia and paroxysmal tachycardia 8.9/1000 (5). The difference between the total number of registered episodes and the number of certain episodes, shown in table 2.2, indicates that some diagnostic uncertainty remains, the extent of which is different for each category. Final diagnostic certainty in the category ischaemic heart disease is 83%, in heart failure 87%, in atrial fibrillation 96% and other rhythm disorders 90%. In a short registration period in Northern Limburg, a somewhat lower degree of diagnostic certainty was reached varying from 70% (ischaemic heart disease), to 93% (heart failure), 81% (atrial fibrillation) and 85% (other rhythm disorders) (7).

referrals to the cardiologist

Within the group of patients with a cardiovascular diagnosis, 19.9/1000 patients are referred to a specialist (3), a number similar to that found by the LINH (the National Information Network of General Practice, het Landelijk Informatie Netwerk Huisartsenzorg): 17/1000 (6).

In the record of all episodes of patients who are referred, ischaemic heart disease is top of the list. Table 2.3 presents a survey of the referral rates of the main cardiac categories.

table 2.3. **referral rates of the main cardiac diagnoses in the Transition project (3) versus the rates found in Northern Limburg (7)**

diagnosis (ICPC-code)	referral rate transition project %	referral rate northern limburg %
ischaemic heart disease (K76)	28	36
heart failure (K77)	15	21
atrial fibrillation (K78)	12	14
paroxysmal extrasystolia and tachycardia (K79 and K80)	10	9

The Transition project distinguishes referrals at the beginning of an episode and those during the follow-up. For all diagnoses the referral in the beginning was higher than later in an episode. In the case of the diagnoses ischaemic heart disease, atrial fibrillation and valve disorder, the difference was even more than double.

There are some differences between the referral rates found in the Transition project and those found in Northern Limburg. These regional differences are also described elsewhere (4). In Northern Limburg an obvious influence of diagnostic uncertainty on the referral rate was found: of all patients in whom the diagnosis was not certain twice as much were referred, compared with those in whom the diagnosis was certain (7).

discussion

Variations in the method of collecting and classifying the data in the several registration systems hamper the ability to make a good comparison. Prevalence data refer sometimes to episodes, sometimes to patients. Nevertheless the data do show a tendency into the same direction.

Complaints of the heart are important reasons for encounter that lead only in about 25% of the cases to a cardiac diagnosis. In a further quarter to one third of the cases the final diagnosis is a symptomatic one.

The conclusion must be that there are serious diagnostic problems for the GP. Once a diagnosis has been stated, there is certainty about it in more than 80% of the cases. Chronic ischaemic heart disease is the most prevalent of all cardiac diagnoses. The prevalence of chronic ischaemic heart disease alone can be compared with that of diabetes mellitus. Heart failure and rhythm disorders are other important diagnoses with a prevalence of more than 10/1000 patients. A vast rise of the numbers of patients with chronic ischaemic heart disease or heart failure can be expected in the near future (8).

Of all patients diagnosed with a cardiac disorder, between 10 and 28% are referred, depending on the diagnosis. So there are many others who are under control of their GP. From the registration projects we used we have no specific information about the problems the GPs meet in managing their heart patients. We suppose that there must be some in view of the literature about the management by the GP of some categories of chronic heart diseases (9-12).

It has been suggested that a percentage of the referrals, up to 30%, might be unnecessary (13). Although this has never been investigated for cardiologic referrals, we assume that this will be the case too for cardiac disorders. In any case, the referral rate is influenced by diagnostic uncertainty (7).

The conclusion is that the cardiac system with its different disorders does indeed form an important part of the morbidity presented daily to the GP, who will often be confronted with aspecific complaints that will cause diagnostic uncertainty. Moreover, the future rise in the prevalence of the main chronic cardiac diseases and their unfavourable prognosis require the GP to devote much attention to the management of these disorders.

In this light one may expect that new models of collaboration between GPs and hospital doctors, as occurring in joint consultation sessions, can contribute to an improvement of the aspects mentioned (11).

appendix

explanatory list of terms used in this chapter

episode a defined period of a disease from the moment of presentation of complaints until the moment that there are no more problems, the problem has solved or no more medical help is needed. An episode includes a first contact and, if present, one or more follow-up contacts.

incidence number of new cases (patients) registered by the GP of a disease per 1000 registered subjects per year.

incidence of episodes number of new episodes registered by the GP per 1000 registered subjects per year.

prevalence number of registered cases (patients) known by the GP of a disease per 1000 subjects per year. This definition refers to period prevalence, including both new and already known cases seen per 1000 subjects per year (to be distinguished from point prevalence, the number of prevalent cases on a certain point in time per 1000 subjects).

prevalence of episodes number of patients that in one year consult their GP for a specific episode per 1000 subjects. This definition refers to period prevalence of episodes, including both new and ongoing episodes. In case of chronic health problems requiring doctor's consultation over a long period, the latter sometimes cover episodes of many years.

references

1 **Hart- en vaatziekten in Nederland in 1996 [Heart and vessel diseases in the Netherlands in 1996]**
The Dutch Heart Association. The Hague 1996

2 Lisdonk EH van de, Bosch WJHM van den, Huygen FJA, Lagro-Janssen ALM
Ziekten in de huisartspraktijk [Diseases in general practice]
Utrecht: Bunge 1994

3 Okkes IM, Oskam SK, Lamberts H
Van klacht naar diagnose. Episodegegevens uit de huisartspraktijk [From complaint to diagnosis. Data of episodes in general practice]
Bussum: Uitgeverij Coutinho, 1998

4 Velden J van der, Bakker DH de, Claessens AAMC, Schellevis FG
Een nationale studie naar ziekten en verrichtingen in de huisartspraktijk [A national morbidity and intervention study in general practice]
Utrecht: Nivel, 1991

5 Metsemakers JFM, Höppener P, Knottnerus JA, Kocken RJJ, Limonard ChBJ
Computerised health information in the Netherlands: Registration Network of Family Practices
Br J Gen Pract 1992;42:102-106

6 **LINH-rapportage. Landelijk Informatie Netwerk Huisartsenzorg [Report. National Information Network of General Practice]**
Maastricht/Utrecht, 1995

7 Vlek JFM, Esch HWMJ van, Verest LFHM, Vierhout WPM, Crebolder HFJM
Cardiale problemen in de huisartspraktijk: een inventarisatie [Cardiac problems in general practice: an inventory]
Hart Bull 1997;28:55-9

8 Bonneux L, Barendrecht JJ, Meeter K, Bonsel GJ, Maas PJ van der
Estimating clinical morbidity due to ischaemic heart disease and congestive heart failure: the future rise in heart failure
Am J Public Health 1994;84:20-8

9 Vlek JFM, Buntinx F, Crebolder HFJM, Ree JW van
De rol van de huisarts bij de begeleiding van patiënten na een myocardinfarct [The management of the postmyocardial infarct patient by the general practitioner]
Ned Tijdschr Geneeskd 1994;138:2049-53

10 Sudlow M, Thomson R, Thwaites B, Rodgers H, Kenny RA
Prevalence of atrial fibrillation and eligibility for anticoagulants in the community
Lancet 1998;352:1167-71

11 Horne R, Coombes I, Davies G, Hankins M, Vincent R
Barriers to optimum management of heart failure by general practitioners
Br J Gen Pract 1999;49:353-7

12 Welton M, Croft P, Welton J
General practitioners' use of aspirin in the secondary prevention of vascular events: knowledge, attitudes, and current practice
Br J Gen Pract 1999;49:607-10

13 Engelsman C, Geertsema A
De kwaliteit van verwijzingen [The quality of referrals]
[Proefschrift] [Thesis] Groningen: University of Groningen, 1994

chapter 3

research questions, design and methods of the trial

box 3.1. **characteristics of the joint consultation**

The joint consultation is a meeting of a small group of 3–5 GPs and a cardiologist during which they examine and discuss patients who are invited by their GP. The GPs can select patients when there is diagnostic and/or therapeutic uncertainty that in many cases normally would have led to a referral. The sessions are held once a month during 1-1.5 years, in the surgery of one of the participating GPs. Each member of the group can invite one or more patients for each session that last about 1.5 hours during which 4 patients at most can be discussed per session.

The GP is responsible for the session running smoothly as for the explanation of the findings with his patient. As a result of the joint consultation the GP can gain more diagnostic or therapeutic certainty, so that he can go on managing the patient himself, or he can be advised to refer the patient to secondary care.

introduction A randomised controlled trial has been conducted to study the effectiveness of joint consultations of GPs and cardiologists.

This chapter describes the characteristics of the joint consultation, the research questions, the design and methods of the trial and some organisational aspects. Some characteristics of the participating GPs and consultants will be mentioned.

research questions

This study investigates the following general research question: What are the effects of joint consultation sessions of GPs and cardiologists in general practice for the patients, GPs and cardiologists?

Not only are the effects on patients, GPs and cardiologists the objects of the study, but so also are the effects for the health care system. Identifying how often a joint consultation has been successful is important, because the extent of this success determines the value of the working method. Giving the answer to this question could be complicated because the joint consultation can be appreciated in a very different way by each of the participants just as is the case for the appreciation of referrals (1).

The following factors are of importance.

For the patient a joint consultation can be considered to be successful when:

- a correct diagnosis has been stated
- an appropriate treatment has been given
- he is satisfied with the way his problem has been handled.

For the GP a joint consultation will be successful when:

- his questions have been answered
- the joint consultation has added value.
- a referral can be prevented.

For the cardiologist a joint consultation is successful when:

- he is able to conduct the consultation in a proper way
- he judges that the patients has been selected correctly
- the joint consultation contributes to a better selection of those patients who can be treated in primary care and those who have to be referred.

For the health care system it is important that this collaboration method is effective, efficient and feasible.

The general research question can be subdivided into the following questions:

- With what kind of complaints and for which reasons are patients selected for a joint consultation?
- Are the diagnoses that are stated during a joint consultation different from the GP's diagnoses stated before the joint consultation occurred? Is this more often the case for specific categories of diagnoses?
- Does the treatment that is proposed during the joint consultation differ from the

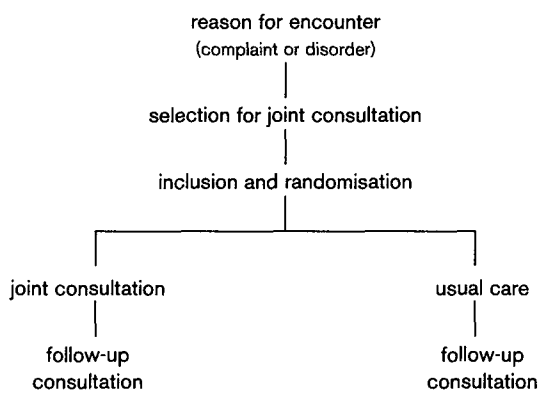
treatment that would have been carried out if the patient had not been discussed?

- How often and for which diagnoses could a referral be avoided?
- Is the state of health of patients who have been discussed during a joint consultation different from that of patients who got usual care?
- How often have the diagnoses of the joint consultation patients to be changed in the follow-up period compared with the patients who got usual care?
- Do the joint consultation sessions have added value for the GP?
- What are the experiences of the patients with the joint consultation method?

general research design

The project was set up as a randomised trial with the joint consultation as intervention. Its effects are to be compared with those of usual care provided to a control group of patients. After a follow-up period of about one year, all patients in both groups were to be seen in another joint consultation of their own GP and a consultant. In the intervention group the consultant at follow-up was not the same person the patient had seen in the joint consultation after randomisation, to ensure an objective judgement of the situation at follow-up. The design chosen was similar to that of the project of Vierhout et al. who studied the effects of joint consultation in the case of patients with complaints of the locomotor system (2). (figure 3.1)

trial profile of the joint consultation project **Figure 3.1.**



operationalisation of research methods

the joint consultation selection procedure

When the GP was confronted with a patient with a cardiac problem during the normal consulting hours, he could decide to include that patient in the research project. The patient was asked to participate in a study of the GP's performance on cardiac problems in primary care. If the patient agreed, randomisation took place. The patient was assigned to either the intervention group or the control group. If assignment was to the intervention group, the GP gave further information about the joint consultation, asked the patient to sign a consent form, invited him for the next session to be held, gave the patient a questionnaire to fill in, and asked him to be available for follow-up. If the patient was assigned to the control group, the GP offered usual care, asked the patient to complete a questionnaire and to be available for follow-up. Patients in both groups were invited for a joint consultation that was held about one year after inclusion in the project. For the patients in the intervention group, the final joint consultation was performed by a different cardiologist.

the participating GPs and cardiologist-consultants

In five regions in the south-east of the Netherlands, the GPs received a written invitation to participate or were approached directly by a research staff member. For the GPs who enrolled an information meeting was held. By then the GPs had also filled in the questionnaire on knowledge assessment (see chapter 5). Then the matching of the GPs' groups and cardiologists took place. Before the GPs' enrolment in each region, the cardiologists of the referral hospital were requested to participate. The cardiologist's fee to participate was 100 guilders per session, the GP's fee was 50 guilders per session.

inclusion and exclusion criteria

Patients could be included if:

- there were cardiac complaints or test results for which the GP was uncertain about the diagnosis and/or the treatment, while a referral was not necessary at that moment
- the patient was uncertain or anxious about having complaints attributed to his

heart, for which he wanted a referral to the cardiologist but which was not judged to be necessary by the GP
- the GP wanted to deliberate with the consultant about an intended referral
- the GP wanted an audit of his performance in a specific case.

Patients were excluded from the study if:
- there was an acute cardiac problem that demanded urgent medical intervention
- the GP was sure about being able to handle the problem himself (unless he wanted an audit)
- the GP was sure about the necessity of a referral
- the GP knew that specialist testing was needed
- the patient was under regular control of a cardiologist other than the consultant.

expected inclusion complaints and disorders

A joint consultation could be considered if the patient had one of following complaints or diseases:
- complaints or disorders of the cardiac rhythm
- murmurs without important anatomic anomalies
- heart failure, especially in the elderly
- chest pain, unless there was suspicion of unstable angina pectoris, myocardial infarction or other acute disease
- stable angina pectoris
- status after (uncomplicated) myocardial infarction
- problems in the treatment of hypertension
- abnormal electrocardiogram
- other abnormal test results
- anxiety of the patient about his cardiac condition that could not be quelled by the GP.

randomisation procedure

In choosing the randomisation procedure we had to take into account the following considerations. In a trial the randomisation is normally performed after the patient has given informed consent: the patient is fully informed about the course of things in the different trial arms he can be assigned to. But the patient does not know in which arm he will be located. Our study could not be blinded, so in this approach the patients of each arm would be aware of what

was going on in the other arm. So patients assigned to one arm could, after randomisation, decide to stop participation because they really wanted assignment to the other arm. This could harm the internal validity. This was the main reason to choose a pre-randomisation (3) design that was approved by the Medical Ethical Committee (2). In this design the patient gets only information about the arm he is assigned to, so after randomisation has taken place.
As is clear from the above the randomisation was at patient level. Another option was randomisation at GP's level. This approach seemed not to be feasible because of the huge number of GPs that would be needed to reach sufficient power. Another reason for not choosing this option was the medical education effect. We expected that the GPs would learn from the joint consultation sessions. The medical education effect would benefit patients in both the intervention group and the control group. When there are differences in outcome between the groups, they can mainly be due to the joint consultation itself.
The practical course was as follows. After having selected a patient for the project, the GP took a numbered envelope from a stack of which the sequence had been determined by the research team that had the randomisation key. On opening the envelope the GP would know whether the patient was assigned to the intervention or to the control group. Then the GP would know too what information the patient had to be given.
The patients of the intervention group were invited to participate in the next joint consultation session. The control group patients received the care the GP was used to give in these specific circumstances. Both groups got information specifically about the arm they were assigned to and the follow-up joint consultation. They were asked to complete a questionnaire. The researchers could control the randomisation compliance of the participating GPs by checking the sequence of numbers of the returned questionnaires.

variables

There are many variables that will influence the effects of joint consultations: the independent or predictor variables, and many that are outcome or effect variables. Variables can be distinguished on different levels: at the level of the patient, the GP, and the cardiologist. Table 3.1 shows the variables that are used in the study.

independent and dependent variables

table 3.1.

variables	independent	dependent	used in bivariate analysis	used in regression analysis
patient variables				
background data	x		x	x
complaint				
type	x	x	x	x
duration	x		x	x
seriousness	x	x	x	x
anxiety	x	x	x	x
psycho-social				
'stress'	x			x
life events	x			x
abnormal examination	x			
diagnosis	x	x	x	x
state of health (follow up)	x	x	x	x
co-morbidity				
cardiac	x			x
non cardiac	x			x
feeling of well being	x	x	x	x
care expectations	x			
care satisfaction		x	x	
appreciation of joint consultation		x	x	
GP variables				
background data (age, practice, experience)	x			
reasons patient's selection	x		x	x
diagnosis shift	x	x	x	
GP's performance				
before joint consultation	x			x
after joint consultation		x	x	x
added value		x		
knowledge*	x	x		
referral rate				
general referral rate*	x			
during the project*		x	x	x
cardiologist variables				
background data	x			
judgement complaint	x			
diagnosis different from GP		x	x	x
judgement inclusion	x			
advice about management		x		
judgement joint consultation		x		
judgement management till joint consultation	x	x		x

(*) these variables will be later discussed separately in chapters 5 and 8

measurements

After inclusion, the **patients** in both groups completed a questionnaire about their complaints, the care provided till then, and their expectations of the care. Part of the questionnaire comprised the Heart Patients Psychological Questionnaire (HPPQ). This instrument assesses four indicators of quality of life, of which we used the subjective feeling of well being, disability and despondency (4). It has also been validated for non-cardiac patients (5).
The intervention group patients filled in a second questionnaire after the joint consultation about their experiences.
After the inclusion of patients, the **GPs** completed a questionnaire about the complaints of each patient, their diagnosis, the reason to select the patient for the project and their findings of physical examination and other tests. The questionnaire about the control patients comprised a part about the intended treatment. The GPs completed a further questionnaire about the patients that participated in a joint consultation session, which related to the findings of the joint consultation and their experiences.
The **cardiologists** completed a questionnaire about each patient seen during a joint consultation concerning their findings of physical examination, their diagnosis and their advice for further testing or treatment.

All **patients** filled in a questionnaire about their condition shortly before the follow-up consultation took place. Part of this list was again the HPPQ. Similarly, after the follow-up consultation the **GPs** and **cardiologists** filled in a questionnaire about the course of the complaints or disease in the follow-up period. In all lists the complaints and disorders were coded according to the International Classification of Primary Care (ICPC) (6). See the appendix for a complete survey of the titles of all questionnaires used.

the referral rates

Data about the referrals in the practice population of the participating GPs and their colleagues in the areas were obtained from the two most important Health Insurance Companies in these areas. These data included referrals to the cardiac outpatient clinics and to the other outpatient clinics in general. The yearly referral rates from 1994 to 1997 were obtained, the full period in which the study was carried out including the follow-up period. All the GPs gave consent to retrieve the data.

sample size and statistics

We assumed that in normal circumstances about 35% of the patients who were selected for the joint consultation would have been referred. A reduction of the percentage by at least 20% should be detected, with alpha 0.05 and beta 0.10. So a sample size of at least 135 patients per group was required. On the basis of a withdrawal rate of 25%, 350 patients, 175 per group, were to be selected for the project.

Data management was carried out using the computer program SPSS. Bivariate analysis was performed with cross tables. Statistical assessment was carried out using the student t-test for continuous variables and the chi square test for discrete variables. Testing was in all cases two-sided, with the significance level held at 0.05. Multivariate analysis was carried out by backward stepwise multiple logistic regression analysis to assess the influence of each independent variable on various dependent variables, taking all significant determinants into account simultaneously.

the organisation of the joint consultation sessions and of the control sessions

All GPs got a continuity sheet with a description of all organisational and practical aspects of the joint consultation. The groups were advised to make regular appointments about the planning of the joint consultation sessions with their consultant. If the GPs had not selected one or more patients, the session could be countermanded. In addition, it was expected that some subjects would be discussed in general in connection with the problems of an examined patient. The groups were free to do so in any way they wished.

To organise the follow-up consultation sessions, the GPs received from the researchers a survey of the patients and the period in which these patients should be subsequently planned. The patients were sent a questionnaire that they should fill in before the follow-up consultation took place. The GPs were asked to make the appointments with the consultants.

the participants

In 5 areas in the south-east of the Netherlands 17 groups comprising a total of 56 GPs started the project of whom 7 dropped out; so 49 GPs in 16 groups completed the study, while 13 cardiologist-consultants were involved, see table 3.2

table 3.2. **number of participating GPs and cardiologists in the different areas**

	number of groups		GPs		cardiologists
area	started	completed	started	completed	
Veldhoven	6	5	19	14	5
Maastricht	6	6	20	18	2
Geleen	1	1	3	3	3
Kerkrade	2	2	7	7	2
Venlo	2	2	7	7	3
total	**17**	**16**	**56**	**49**	**13***

* some cardiologists were consultants in more than one area, so the total number of participating cardiologists is 13 and not 15

In the Veldhoven area one group of 4 GPs dropped out after two joint consultation sessions because they failed to select patients. One member of another group kept aloof from the beginning and then he too dropped out. In the Maastricht area two GPs working in a health care centre announced their participation but never included patients. In all 49 GPs completed the whole course of the project, mostly in groups of 3 GPs, except one consisting of 2 GPs and 2 groups of 4 GPs.

In one area the cardiologist-consultant was not established nor was he a member of the partnership of cardiologists of the referral hospital. In two other areas only some of the joint consultation sessions were given by a consultant established and working in that particular area.

Some characteristics of the participating GPs are shown in table 3.3. Most of them are experienced GPs. About one third were working in primary health care centres. This percentage does not reflect the figures nationally, which indicate less than 10% of GPs working in such centres.

age, years of experience in practice and practice characteristics of the participating GPs table 3.3.

n=49		%
age	< 30 years	4
	30 - 39	21
	40 - 49	63
	> 50	12
gender	female	10
experience in practice	< 5 years	16
	6 - 10	16
	11 - 15	20
	16 - 20	30
	> 20	18
practice characteristics	solo	38
	partnership	29
	health care centre	33

references

1 Grace JF, Armstrong D
Referral to hospital: perceptions of patients, general practitioners and consultants about necessity and suitability of referral
Fam Pract 1987;4:170-5

2 Vierhout WPM, Knottnerus JA, Ooij A van, Crebolder HFJM, Beusmans GMHI, Pop P, Wesselingh-Megens AMK
Effectiveness of joint consultation sessions of general practitioners and orthopaedic surgeons for locomotor-system disorders
Lancet 1995;346:990-4

3 **Gezondheidsraad. Informed consent en prerandomisatie. Verslag van een bij de Gezondheidsraad gevoerde discussie [Health Council of the Netherlands. Informed Consent and pre-randomisation. A report of a discussion conducted by the Health Council of the Netherlands]**
Den Haag: Gezondheidsraad 1999. Publicatie WV A99/04

4 Erdman RAM
Welbevinden bij hartpatiënten [Feeling of well-being in heart patients]
[Proefschrift] [Thesis] Rotterdam: Erasmus University, 1981

5 Rombouts R, Erdman RAM, Breteler MHM
De bruikbaarheid van de Medisch Psychologische Vragenlijst voor Hartpatiënten [The feasibility of the Heart Patients Psychological Questionnaire]
Gedrag en Gezondheid 1986;14:63-67

6 Lamberts H, Wood M
International classification of primary care (ICPC)
Oxford: Oxford University Press, 1987

chapter 4

effectiveness of joint consultation sessions of general practitioners and cardiologists in primary care setting: a randomised controlled trial

Submitted as:

Effectiveness of joint consultation sessions of general practitioners and cardiologists in primary care setting: a randomised controlled trial

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abstract

background Joint consultation sessions of a small group of GPs and a specialist proved to be an effective way to decrease the referral rate of orthopedic patients. Cardiac complaints form an important category of health problems with high referral rates.

objectives To study the effects of joint consultation on referral rate and quality of care for patients with cardiac complaints.

methods In a randomised controlled trial 49 GPs participated in 16 consultation groups each with one of 13 cardiologists in monthly joint consultation sessions during about 1.5 years. The GPs selected patients of whom they were uncertain about diagnosis or therapy. Patients needing urgent referral were excluded. Patients were randomly assigned to joint consultation or to usual care. After a follow-up period all patients had a joint consultation with a cardiologist and their own GP.

results In the intervention group 148 selected patients fulfilled the whole protocol, in the control group 158 patients. In the intervention group 34% of the patients were referred versus 55% in the control group ($p<0.05$), and fewer patients underwent further diagnostic procedures: 7% versus 16% ($p<0.05$). The quality of care was similar in both groups.

conclusion The joint consultation method reduces the referral rate, while the care provided is as good as usual care.

keywords Joint consultation/general practitioner/cardiologist/referral rate/shared care.

introduction In the Netherlands the general practitioner (GP) plays an important role as gate-keeper to specialist care (1). His task is to ensure that a patient receives optimal care, only about 10% of the patients presenting to their GP is referred to a specialist (2). Still, referrals seem to have been unnecessary in up to 30% of the cases, often because of inappropriate diagnostic procedures (3-5). In about 40% of cardiac referrals diagnostic uncertainty is the reason for referral (6,7).

We hypothesize that a reasonable number of the referrals is unnecessary.

As to the process of diagnostic assessment joint

consultation sessions were effective in decreasing the referral rate for orthopedic disorders (8). Further studies using this method in other clinical fields have been encouraged (9). Cardiac complaints and disorders form an important category of health problems for patients, GPs and cardiologists (6). Therefore a randomised controlled trial has been conducted to study the effect of joint consultations of GPs and cardiologists for cardiac patients.
The objectives were to find out whether the patients received care that could at least equal usual care, to what extent referrals could be prevented and whether the kind of complaints or diagnoses affected these results. In addition the patient's perception has been investigated.

patients and methods

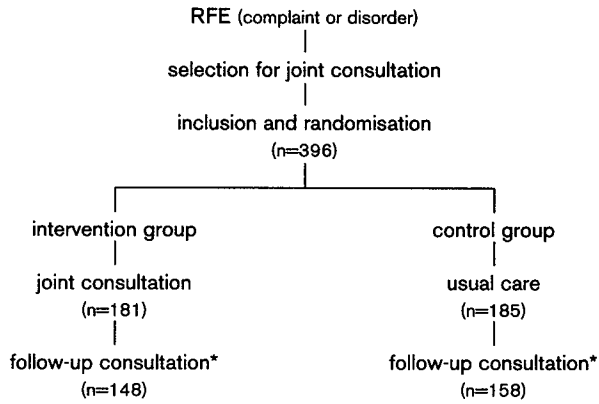
patients

Patients with cardiac problems the GP felt uncertain about could be selected. Patient's uncertainty or fear of cardiac disease could also be reasons for selection. There was no age limit. Acute disorders and patients who needed acute referral were excluded.
Selected patients were randomly assigned to the intervention group that went into the joint consultation or to the control group that received the care their GP usually provides (figure 4.1). All patients gave written informed consent.

joint consultation session

The intervention group patients were invited for a physical examination and an evaluation during a joint consultation session of a small group of 3 or 4 GPs and a cardiologist with the aim to give the GP a proper advice on how to carry on. During about 1.5 year these sessions were held monthly in the surgery of one of the GPs. Each session 3-4 patients could be discussed.
All patients were subjected to a follow-up joint consultation of their own GP with a cardiologist after one year.

figure 4.1. **trial profile of the joint consultation project**



withdrawal between inclusion/randomisation and follow-up

reasons for withdrawal	intervention group	control group
	n	n
no response to invitation	11	13
removal or change of GP	9	8
died	8	4
referred before joint consultation	8	-
refused further cooperation	6	6
administrative reasons	4	2
randomisation faults	2	1
bad condition	1	1
other	5	1
total	**54**	**36**

randomisation

We chose a pre-randomisation design at patient level. After randomisation the patients were fully informed about the procedure used within the group they had been assigned to, but they were not informed about the existence of the other trial arm. This approach was necessary to achieve sufficient internal validity, because the study could not be blinded to the patient (10-12).
The pre-randomisation design for the evaluation of joint consultations has been approved by the Ethical Committee of the University Hospital Maastricht.

measurements and variables

At inclusion all patients and GPs completed questionnaires about the complaints and diagnoses. The intervention group patients, their GPs and cardiologists completed questionnaires once again after the joint consultation. After the follow-up consultation all patients, GPs and cardiologists again filled in a questionnaire. The Heart Patients Psychological Questionnaire (HPPQ) (13), was part of the patient's questionnaires. This instrument has been validated for non-cardiac patients (14). It measures four indicators of 'quality of life', of which we used well-being, disability, and despondency.

All complaints and disorders were classified according to the International Classification of Primary Care (ICPC) (15).

Data about the referrals in the study population were obtained from the GPs' questionnaires, and data on all referrals in the participating practices were provided by two large Health Insurance Companies.

A clinical review of patients who died during the project was performed by a cardiologist to see whether the cause of death could be related to the joint consultation.

Independent variables, evaluated as possible effect modifiers, were: patient's sex and age; characteristics (type, duration, severity) of the complaint as described by the GP; the reasons for patients' selection. Patient effect variables were: the general state of health as reported by the patient; the degree of well being; patterns of complaints at follow up; the severity of the patient's condition as assessed by the cardiologist and the patient's worrying about his complaint. Care effect variables were: the number of diagnostic actions by the GP; the number of referrals to cardiologists; changes of diagnosis in the period between initial and follow-up consultation.

statistics

To detect a reduction of 20% in the referral rate and an expected referral rate of 35% in the control group, a sample size of at least 135 patients per group was required (alpha 0.05, beta 0.10). Since a withdrawal rate of 25% was expected, 175 patients per group were to be included.

Data management and analysis were carried out using SPSS. Between group comparisons for continuous and discrete variables were carried out using the student t-test and the chi-square test respectively. Testing was in all cases two-sided, the significance level being 0.05.

Multivariable analysis was carried out by backward stepwise multiple logistic

regression analysis to assess the effect of the intervention taking the influence of possible effect modifiers into account simultaneously.

results

baseline data

In the project that was carried out between 1994 and 1998 in 5 southern districts of the Netherlands, 49 GPs participated in 16 consultation groups together with 13 cardiologists. The GPs selected 396 patients of whom 306 completed the whole protocol: 148 in the intervention and 158 patients in the control group. The withdrawal rate was 23%. The reasons for withdrawal were similar in both groups (figure 4.1). During the project 8 patients died in the intervention group and 4 in the control group (table 4.1). This difference was not statistically different. Of the intervention group patients two were under control of a cardiologist, two were elderly patients with an unfavourable prognosis, one refused any further medical help, one was included on account of dyspnoea that was not due to a cardiac cause and two died from non-cardiac causes. In the control group one patient with an unstable angina pectoris died shortly after the initial consultation. Of the others the cause of death was not cardiac. (table 4.1)

Age and relevant clinical variables were similarly distributed (table 4.2).
Of the GP's reasons for selecting the patients diagnostic uncertainty prevailed over therapeutic uncertainty ($p<0.01$).

review of 12 patients who died during the follow-up period table 4.1.

number	sex	age	diagnosis	cause of death	time* month	contr. by card.	comment
control group							
1	f	75	instable a.p.	myocardial infarction	0.5	n	
2	m	74	valve disorder	lung carcinoma	4.0	y	
3	f	86	heart failure	general deterioration	1.5	n	
4	f	79	heart failure	colon carcinoma	11.0	n	
intervention group							
1	f	76	heart failure	mors subita	5.0	y	
2	f	85	heart failure	heart failure	8.0	y	
3	f	86	angina pectoris	mors subita	16.0	n	
4	m	85	heart failure	heart failure	11.0	n	
5	f	77	aorta stenosis	heart failure	5.0	n	patient refused medical help
6	f	79	dyspnoea due to kyphoscoliosis	mors subita	4.0	n	no cardiac diagnosis
7	f	78	atrial fibrillation	colon carcinoma	8.0	n	
8	m	72	atrial fibrillation	non-Hodgkin	11.0	n	

(*) time: number of months between inclusion and date of death
contr. by card.: controlled by cardiologist

The GPs selected patients with a great variety of reasons for encounter (RFE) classified in more than 20 ICPC codes. Chest pain was the most important category, presented in 24% of the cases. Other substantial categories were: palpitations 21%, dyspnoea 10%, heart murmur 10%, fatigue 7%, angina pectoris 7%. There was no relevant difference in the distribution of the various complaints. Only the complaint 'dyspnoea' occurred more often in the intervention group ($p<0.01$).

table 4.2. **baseline characteristics of the intervention and control group**

		intervention group n=148 %			control group n=158 %		
demographic data							
male		37			46		
age	<20 years	8			8		
	20-39	13			13		
	40-59	32			31		
	60-79	37			44		
	≥ 80	10			4		
main complaint lasting < 1 month		20			25		
time since first visit of GP < 1 month		63			61		
patients worrying a lot		47			41		
GP's reason to select the patients *							
uncertain about diagnosis		34			43		
uncertain about therapy		25			21		
uncertain about diagnosis and therapy		33			36		
defensive reasons		19			11		
categories of 'quality of life' **		high	moderate	low	high	moderate	low
well-being		16	71	13	18	64	18
disability		24	65	11	24	60	16
despondency		14	69	17	21	60	19

* *the GPs could fill in more categories*

** intervention group n=132, control group n=142: children <18 years were excluded from this questionnaire

findings at the joint consultation (intervention group) and initial consultation (control group)

The main diagnoses stated during joint consultation were: angina pectoris in 14% of the 148 cases, (paroxysmal) extrasystolia or tachycardia 12%, valve disorders 13%, atrial fibrillation 7% and heart failure 5%. Of the GPs' initial diagnoses 56% were agreed during the consultation. Angina pectoris was agreed in 80%, atrial fibrillation in 78% and valve disorders in 75% of the cases. On the other hand 33% of the diagnosis (paroxysmal) extrasystolia or tachycardia was agreed as was 33% of the heartfailure cases.

In the intervention group significantly less electrocardiograms and x-rays were made, and less patients have been referred to a cardiologist (23% versus 35%, $p<0.05$) (table 4.3). The difference in referral rate is most prominent for the diagnosis paroxysmal extrasystolia or tachycardia (10% in the intervention group versus 30% in the control group) and for valve disorders (32% versus 55%), less prominent for angina pectoris (40% versus 49%).

For heart failure there was a reverse pattern (29% versus 20%), as was for atrial fibrillation (36% versus 27%).

The intervention group patients considered their complaint or problem to be satisfactorily dealt with in 19% and appropriately in 81% of the cases, compared with 39% and 61% of the control group patients, respectively ($p<0.01$). Of the patients 97% had much confidence in the joint consultation.

The GPs felt that the joint consultation gave them more diagnostic certainty in 62% of the cases and more certainty about treatment in 58%.

findings after the follow up period

The follow up period lasted 1.25 years on average. More control group patients had been referred (table 4.3). No other differences were observed.
The referral rates showed an average decrease of cardiac referrals of 5 per 1000 patients, which is 10%, in the follow-up year, compared with the referral rate in the whole region ($p<0.05$).
During the follow-up period the diagnosis in the control group had to be changed more often. We left the results of the multivariate analysis out of consideration because they did not reveal significant effect modification.

table 4.3. **outcome after inclusion and after follow-up (1.25 years), regarding all effect variables in intervention and control group.**

effect variable		intervention group n=148 %		control group n=158 %	
further diagnostics after inclusion					
	electrocardiography	7		16*	
	x-ray	1		5*	
referred	**total**	**33**		**52***	
	directly after inclusion		23		35
	in follow-up period		10		17
situation after follow-up					
still complaints		56		60	
severe condition		6		4	
patients worrying a lot		12		16	
health status: good (according to patients)		41		41	
feeling of well-being (good)		27		34	
no disability feeling		35		36	
no despondency feeling		23		24	
diagnosis changed		25		35	

* $p<0.05$

discussion

Joint consultations of GPs and cardiologists provide a quality of care equal to usual care for patients with cardiac complaints and disorders, despite a decrease of the number of investigations and referrals.
In the intervention group, although statistically not significant, more patients had died but there was no indication that any of these cases was related to a delay or a lack of care resulting from the joint consultation. Similar to the consultation project for orthopedic complaints a pre-randomisation design was used (8) as the patients could not be blinded to the intervention. Since usual care was available to the control group, and because evaluation would otherwise not be possible, this design was judged to be appropriate (11,12).
We chose randomisation at patient level because we wanted to evaluate the specific contribution of the joint consultation as compared to usual care by the same GPs. In our study the diagnosis angina pectoris represented the largest diagnosis category. Although it is recommended to refer all patients of

whom the GP considers the diagnosis for further investigation (16), according to the Dutch College of General Practitioners this is neither possible nor necessary (17), and from our results we conclude that joint consultations contribute to the selection of those patients who need indeed specialist investigation. Joint consultation sessions especially help to limit the referral rate for (paroxysmal) supraventricular tachycardia and extrasystolia. Probably this is the result of better medical history taking and diagnostic skills. Looking at the lower referral rate in the control group it might be possible that GPs underestimate the severity of atrial fibrillation.

Murmurs seem to represent a considerable diagnostic problem for the GPs regarding the greater number of valve disorders that the cardiologist found as main diagnosis in the intervention group. For atrial fibrillation and murmurs the joint consultation seem a proper method to select those patients who need further specialist investigation.

Diagnosing heart failure in primary care is not easy as it is a syndrome with many possible complaints, each with a low sensitivity (18). The GPs diagnosed heart failure more often than the cardiologists did, which accords with literature findings of false positive diagnoses of heart failure (19). A possible alternative for joint consultation is a direct access for GPs to specialist investigation methods (20-23). A reduction of the referral rate was also achieved, as well as a better selection of patients who needed specialist care. Nevertheless many patients were tested unnecessarily. Compared with these methods the joint consultation method has some advantages: the GP can select all kinds of cardiac problems and for more reasons. Meeting the cardiologist and discussing his own patients probably has impact on the GP's expertise, which will also be advantageous to other patients. The effect of the joint consultation may be further improved by giving access to specialist testing for those patients who otherwise would have been referred as a result of the joint consultation. This could help to cope with the considerable increase of cardiac problems that is to be expected in near future (24). As already suggested other specialties should participate in the joint consultation system as well (8). In spite of the differences between orthopedic surgery and cardiology, the results of joint consultation showed a similar pattern. Furthermore, the joint consultation method can also contribute to the development of new outpatient care models (25).

We conclude that joint consultation is more efficient than usual care to achieve equally effective care for primary care patients with cardiac symptoms. Future studies in other specialty domains are recommended.

references

1 Knottnerus JA
Medical decision making by general practitioners and specialists
FamPract 1991;8:305-7

2 Meyboom - de Jong B
De huisarts als poortwachter [GP as gatekeeper]
Ned Tijdschr Geneeskd 1994; 138;2668-73

3 Jenkins RM
Quality of general practitioner referrals to outpatient departments: assessment by specialists and a general practitioner
Br J Gen Pract 1993;43:111-3

4 Donohoe MT, Kravitz RL, Wheeler DB, Chandra R, Chen A, Humphries N
Reasons for outpatient referrals from generalists to specialists
J Gen Intern Med 1999;14:281-6

5 Engelsman C, Geertsema A
De kwaliteit van verwijzingen [The quality of referrals]
[Proefschrift] [Thesis] Groningen: University of Groningen,1994

6 LINH-Rapportage
Landelijk Informatie Netwerk Huisartsen [National Information Network of GPs]
Maastricht/Utrecht 1995

7 Vlek JFM, Esch HWMJ van, Verest LFHM, Vierhout WPM, Crebolder HFJM
Cardiale problemen in de huisartspraktijk: een inventarisatie [Cardiac problems in general practice: an inventory]
Hart Bull 1997;28:55-9

8 Vierhout WPM, Knottnerus JA, Ooij A van, Crebolder HFJM, Beusmans GMHI, Pop P, Wesselingh-Megens AMK
Effectiveness of joint consultation sessions of general practitioners and orthopaedic surgeons for locomotor system disorders
Lancet 1995;346: 990-4

9 Orton P
Caring and sharing; commentary
Lancet 1995;346:984

10 Zelen MA
A new design for randomised clinical trials
N Eng J Med 1979;300:1242-45

11 Knottnerus JA
Ethiek, recht en de methodologie van het gezondheidszorgonderzoek [Ethics, law and the methodology of health care research]
In: Royal Netherlands Academy of Sciences. Gezondheidsrecht en Gezondheidsethiek. ISBN 90-6984-191-6. Amsterdam: KNAW, 1997

12 **Gezondheidsraad. Informed consent en pre-randomisatie. Verslag van een bij de Gezondheids-raad gevoerde discussie [Health Council of the Netherlands. Informed Consent and prerandomisation. A report of a discussion held at the Health Council of the Netherlands]**
Den Haag: Gezondheidsraad 1999. Publicatie WV A99/04

13 Visser MC, Koudstaal PJ, Erdman RAM
Measuring quality of life in patients with myocardial infarction or stroke: a feasibility study of four questionnaires in the Netherlands
J Epidemiol Community Health 1995;49:513-7

14 Rombouts R, Erdman RAM, Breteler MHM
De bruikbaarheid van de Medisch Psychologische Vragenlijst voor Hart-patienten [The feasibility of the Heart Patients Psychological Questionnaire]
Gedrag & Gezondheid 1986;14:63-67

15 Lamberts H, Wood M
International classification of primary care
Oxford: Oxford University Press, 1987

16 Ghandi MM, Lampe FC, Wood DA
Management of angina pectoris in general practice: a questionnaire survey of general practitioners
Br J Gen Pract 1995;45:11-13

17 Rutten FH, Bohnen AM, Hufman P, Bruinsma M, Leerink HJG, Strootman FA, Brussen AJSH, Dijkstra RH, Laan JR van der
NHG-standaard Angina pectoris [The NHG standard for Angina pectoris]
Huisarts Wet 1994; 37:398-406

18 Khunti K, Baker R, Grimshaw G
Diagnosis of patients with chronic heart failure in primary care: usefulness of history, examination and investigations
Br J Gen Pract 2000;50:50-4

19 Wheeldon NM, MacDonald TM, Flucker CJ, et al.
Echocardiography in chronic heart failure in the community
Quarterly J Med 1993;86:17-23

20 Remkes PAJ, Nijs HGT, Kluiver EP de, et al.
Vrije toegang tot inspannings electrocardiografie met aansluitend cardiologisch advies en feedback aan de huisarts: gunstige invloed op het verwijs-patroon [Free access to exercise-electrocardiography with cardiologic advice and feedback to the GP: favourable impact on referral pattern]
Ned Tijdschr Geneeskd 1996;140:1596-9

21 Remkes PAJ
Niet-invasief cardiaal functie-onderzoek op verzoek van de huisarts [Non-invasive cardiac function investigation at GP's request]
[Proefschrift] [Thesis] Rotterdam: Erasmus University, 1997

22 Murphy JJ, Frain JPJ, Ramesh P, et al.
Open-access echocardiography to general practitioners for suspected heart failure
Br J Gen Pract 1996;46:475-6

23 Francis CM, Caruana L, Kearney P, et al.
Open access echocardiography in management of heart failure in the community
BMJ 1995;310:634-6

24 Bonneux L, Barendrecht JJ, Meeter K, et al.
De toekomst van hartziekten in Nederland: dalende sterfte en stijgende zorgbehoefte [The future of heart disease in the Netherlands: falling mortality and rising care needs]
Ned Tijdschr Geneeskd 1994;138:1612-8

25 Orton P
Shared care
Lancet 1994;344:1413-15

chapter 5

joint consultation as a method of continuing medical education and professional development

submitted as:

Joint consultation as a method of continuing medical education and professional development

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abstract

background Whether joint consultation sessions contributed to increased competence of general practitioners (GPs) was studied quantitatively and qualitatively in the project 'Joint consultation of general practitioners and cardiologists in a primary care setting'.

objectives To assess the effects of joint consultation sessions on the competence of the participating GPs.

methods The quantitative method consisted of a written test of 50 questions about cardiac cases selected from the National Knowledge Test. This test was taken by the participating GPs before the first joint consultation session, once again after the last session, as well as by a control group of GPs.
The qualitative evaluation consisted of interviews with a random selection of 11 GPs about their perceived changes in competence and medical performance, and about the relevance of participating in joint consultation sessions.

results There was no significant difference of the scores of the intervention group's first test and that of the control group: 42 % vs. 43%, compared with the score of the second test: 41% vs. 40%.
In the interviews a majority of the GPs who selected an average or higher number of patients reported a growth of knowledge and an improvement of their medical performance. All GPs judged the joint consultation method as useful and relevant.

conclusion The quantitative evaluation failed to show a difference between intervention and control groups, while the qualitative method made clear that the joint consultation method is an effective method to improve their competence. Moreover it seems to be a meaningful instrument in continuing professional development.

keywords Joint consultation, continuing medical education, professional development, experience-based knowledge, general practitioner.

introduction Participation in joint consultations is considered to have an educational effect on the GP's competence and performance. It should also enable GPs to provide better care to patients who were not subject to the joint consultation.

A study into the effects of joint consultation for orthopaedic complaints has shown that the participating GPs experienced the sessions as an important means of continuing education although it was difficult to provide scientific proof (1). Joint consultations for dermatological problems were also assessed as a very effective method of medical education (2). The design of joint consultation meets all requirements

for the successful improvement of the GPs' expertise. It is small-scale and close to home; it addresses daily issues, and allows GPs to test their own methods of working and acquire new skills in a small group of colleagues (3). Joint consultation satisfies to a large extent the CRISISS criteria for effective continuing education. These criteria include convenience, relevance, individualisation, self-assessment, interest, speculation and systematisation (4). One of the objectives of the research project 'Joint consultation of general practitioners and cardiologists in a primary care setting' was to study the joint consultation as a method of continuing medical education. This project was carried out as a randomised controlled trial investigating the effects of joint consultation on the quality and effectiveness of care. Since more than 30% of the referrals to secondary care seem to be inappropriate (5-7), it is important to investigate whether the joint consultation can contribute to a reduction of the referral rate.
The present study is a side project of the randomised controlled trial (RCT) that aims to determine whether participation in joint consultation sessions about cardiologic patients increases GP's competence.

methods

The design of the RCT and the characteristics of joint consultation are described in chapter 3 (box 3.1) of this thesis.

the quantitative method

The Dutch National Knowledge Test for General Practitioners (NKT) is a written test that is used during the vocational training to assess the growth of knowledge of GP registrars. It consists of statements about cases derived from general practice, sustained by literature references. Whether a statement is true, false or unknown has to be indicated. The test is described as a validated and reliable tool to measure the knowledge of GPs; the same description applies to its thematic parts as well (8). The closer the issues correspond with daily practice, the higher the validity of the method of testing will be (9). This has been confirmed by Ram et al. who found that knowledge testing rates the predictive value for the performance of GPs (10).

The knowledge test that we used focusing specifically on cardiology consisted of fifty questions selected from tract A (general), R (respiratory) and K (cardiovascular) of the International Classification of Primary Care (ICPC) (11) of the NKT. The number of the questions was made in consultation with the National Centre for Evaluation of Vocational Training for GPs. The test included questions about a range of dimensions, such as age categories, diagnostic and therapeutic management, emergencies versus chronic disease management (8). The GPs were subjected to the test twice: before and after the intervention period.

intervention group and control group

All 56 GPs who started participation in the joint consultation project completed the test. The control group, consisting of 41 GPs who had responded to a letter of recruitment sent to all GPs in the five regions, made the same tests as the GPs of the intervention group.

analysis

The number of joint consultation sessions the GP had attended was included as an independent variable, because it was assumed that the increase of knowledge depended on the number of sessions attended. The region in which the GP worked was also included as an independent variable because there could have been some regional differences. The type of surgery in which the GP worked was included in the analysis, because one in three GPs in the intervention group worked in a health centre, but none of the GPs in the control group. With respect to the number of years of practical experience, two categories were distinguished on the basis of literature: more than or less than 10 years of experience (12).

The score of the test was calculated by subtracting the number of incorrect from the number of correct answers (correct minus incorrect score) and was expressed as a percentage of the total number of questions. The mean test score at the end of the intervention period was compared to that at the start. Subsequently, the difference in scores of the intervention group was compared to the differences in the control group's scores. Significance was determined by means of the t-test.

the qualitative method

As the test content of the NKT seems to be restricted to 'evidence-based knowledge' (13), and as it is postulated in literature that in addition to this type of knowledge professional knowledge comprises various forms of personal and experiential knowledge (14), we investigated the possibilities to assess growth of knowledge. Because no validated method, suitable for our purposes, was available, we decided to use a qualitative method. As it was assumed that the participating GPs were able to assess the value of joint consultation as a means to improve competence and expertise, we invited some of them for a semi-structured interview. The interviews covered the following issues, chosen after several discussions within the group of authors: the perceived increase of knowledge and changes in medical performance, and the experienced relevance of the joint consultation method. In a pilot interview the questions about each of these issues were tested.

The GPs were divided into three groups depending on the number of patients they had selected for the joint consultation sessions during the entire intervention period: group 1: less than 4 patients per GP; group 2: 4 to 6 patients per GP; group 3: more than 6 patients per GP. Four GPs from each group were selected at random and invited for the interview. The interviews were held in the GP's practice, recorded on tape and transcribed later.

analysis

The outcomes were analysed on a group level. For each type of question the percentage of positive answers was calculated per GP category by summing the number of positive answers of the GPs per group per issue. The maximum percentage that could be reached was 100%.

results

the quantitative method

The first knowledge test was completed by all 56 GPs in the intervention and 41 GPs in the control group, the second test by 55 GPs and the same 41 respectively. Table 5.1 presents age, years of practical experience and the type of practice of the GPs in both groups.

table 5.1. **composition in percentages of intervention group and control group of GPs for age, years of experience and type of practice**

	intervention group n=56 %	control group n=41 %
age		
<30 years	4	0
30-39	21	27
40-49	63	54
>50	12	19
years of experience		
<5 years	16	7
6-10	16	22
11-15	20	34
15-20	30	15
>20	18	22
type of practice		
solo practice	38	39
group practice	29	61
health centre	33	0

Approximately two GPs in three in both groups had been working in general practice for ten years or more. We were therefore dealing with a group of experienced GPs. The age distribution was almost equal in both groups: approximately 75% were aged 40 or over.

Table 5.2 indicates the mean correct minus incorrect scores on both tests, of both groups as a whole as well as per region. The individual scores vary from 10% to 76% for the first test and 8% to 72% for the second in the intervention group and 12% to 80% and 14% to 64% respectively in the control group. On average, there are no important differences between the results of the tests before and after intervention in any region. This applies to both the intervention and the control groups.

mean correct minus incorrect score for both knowledge tests of intervention group and control group (before and after intervention period), mean scores of both groups, and mean scores per region. table 5.2.

	intervention group		control group	
score	before n=56	after n=55	before n=41	after n=41
total group	**42**	**41**	**43**	**40**
region 1	38	37	52	55
region 2	42	42	38	35
region 3	45	48	48	46
region 4	53	49	40	34
region 5	43	38	46	42

The first category consisting of four groups that participated in 10 sessions or more had an average score of 36% on the second test. The score of the second category of nine groups that attended 6 to 9 sessions averaged 48% and that of the last category of four groups that took part in 5 sessions or less averaged 40%. As the first test was filled in anonymously, a comparison between the above-mentioned categories cannot be made for the first test.
The intervention group included 17 GPs who worked in a health centre scoring slightly, but not significantly higher on the first knowledge test (44%) than the other GPs of the intervention group (41%). On the second test, their score averaged 41%, which was similar to that of the others.
The average score of GPs with more than 10 years of experience was 42% for the first test and 38% for the second, a difference that is not significant.

the qualitative method

Table 5.3 presents the percentages of positive answers for the different issues of questions. The GPs in group 1, with the lowest participation, had a lower self-perceived increase of knowledge than the GPs of the other two groups. The GPs, especially in groups 2 and 3, mentioned several areas in which they judged their knowledge had grown, such as improved assessment and treatment of heart failure, more insight into the pathophysiology of atrial fibrillation, insight into the pharmacokinetics of arrhythmia, improved history taking in case of anginal complaints, abnormal heart rhythm and heart failure.

table 5.3. **interview results: percentage of positive answers per dimension per GP category**

dimension	increase of knowledge %	medical performance %	procedure %
GP category			
group 1 (n=3)	66	33	91
group 2 (n=4)	100	100	100
group 3 (n=4)	83	91	100

All GPs, including those in group 1, considered participation helpful. A number of GPs stated that joint consultation was an ideal method of continuing education, that 'cardiology had really come to life'.

One GP in group 1 and almost all GPs in the other two groups reported that they felt more confident about their performance with respect to cardiac complaints and that they thought their referral policy and the quality of their performance had improved. A number of GPs reported that the joint consultation sessions had given them confidence about the quality of their medical action.

Participating in joint consultation sessions was highly appreciated by all GPs, including those in group 1. Joint consultation was regarded useful for daily practice, partly because certain issues were discussed several times and also because it had a direct impact on their performance. One GP used the following words: '... much more relevant than any other form of continuing education, because you focus mainly on the clinical attitude towards cardiac problems and not so much on all kinds of facts'.

All GPs thought it had been a valuable investment of their time. They highly appreciated the final learning effect, because of 'the improved insight', 'the minimisation of the grey area between referral and non-referral', and 'the opportunity to get to know and improve communication with specialist consultants'. It had been 'the most effective way of providing continuing education'.

discussion

Using the quantitative method we could not demonstrate a growth of knowledge within the intervention group, while on the other hand the findings of the qualitative method showed the opposite. What should this be so? Maybe the NKT was not appropriate, or maybe the test was too short? Or didn't the GPs learn anything? It is hard to believe that the latter option is correct in view of the consistent findings of the qualitative test: a vast majority of the GPs who had selected more than three patients reported an amelioration of competence and performance.

Although the choice of the written knowledge test and its scope was carefully underpinned, it was probably not appropriate to measure the type of transfer of knowledge that occurred during the joint consultation sessions.

In retrospect, it can be observed that the discussions in the joint consultations focused on the clinical approach of cardiac problems and provided more insight into the considerations leading to a particular diagnosis or therapy. What the GPs learned in joint consultation sessions can best be described as how to get a better grip on the cardiac problems they meet in daily practice, i.e. how to make decisions in various, uncertain situations which are often not specific or characteristic for a certain disorder. This can be termed as experience-based knowledge, a type of knowledge that can be distinguished from and is complementary to evidence-based knowledge (13,15). It consists of 'illness scripts' which the GP can retrieve from his memory (16): the more illness scripts are available, the greater the GP's experience. Joint consultation that is focused especially on the clinical experience and knowledge of the consultant would increase the GP's experience-based knowledge, corresponding to the learning situation of trainees in general practice (17). The quantitative test we had chosen was developed to measure evidence-based knowledge. So, probably the quantitative test chosen was not appropriate for our purpose.

Additionally some methodological remarks must be made. Although the knowledge test included questions about a broad range of dimensions, some of these might not have discussed during one of the consultation sessions in one or more groups. So this might have contributed to the lack of effect. We could not investigate this specific aspect because we did not know sufficiently the content of the discussions held in the groups in connection with the case histories.

It can be concluded from the interviews that there is a positive relationship

between the number of issues raised by a GP and the learning effect of the sessions. This confirms the finding that patient-based feedback and patient-mediated interventions are relatively effective methods to change a GP's performance (18).

The number of referrals to cardiologists by the participating GPs decreased during the joint consultation project. This also applies to referrals of patients who were not discussed in the sessions, which can be seen as an effect of the continuing medical education during the project. These findings will be discussed in chapter 8 of this thesis.

Joint consultation fits in with the description in recent literature of the recommended type of continuing education for GPs (19,20). However, it should be investigated what this experienced-based knowledge includes exactly (15,21) and how it should be passed on during joint consultations in order to be used in a better and more explicit way (15). Does the joint consultation add illness scripts to the 'database' or does it help the GP to use existing scripts in a more effective way? Moreover the joint consultation method seems to be a meaningful instrument in continuing professional development as it comprises more skills than medical education such as audit, communication and team building (22).

references

1 Vierhout WPM, Knottnerus JA, Ooij A van, et al.
Effectiveness of joint consultation sessions of general practitioners and orthopedic surgeons for locomotor system disorders
Lancet 1995;346:990-4

2 Schuurman W, Everdingen JJE van, Schadé E
De dermatoloog in de eerste lijn. Verslag van een nascholingsproject [The dermatologist in general practice. The report of an educational project]
Huisarts Wet 1992;35:161-3

3 Grol R
Deskundigheidsbevordering huisartsen [Continuing medical education of GPs]
Medisch Contact 1992;47:275-8

4 Harden RM, Laidlaw JM
Effective continuing education: the CRISISS criteria
Med Educ 1992; 26:408-22

5 Jenkins RM
Quality of general practitioners referrals to outpatient departments: assessment by specialist and a general practitioner
Br J Gen Pract 1993;43:111-3

6 Donohoe MT, Kravitz RL, Wheeler DB, Chandra R, Chen A, Humphries N
Reasons for outpatient referrals from generalists to specialists
J Gen Intern Med 199;15:281-6

7 Engelsman C, Geertsema A
De kwaliteit van verwijzingen [The quality of referral]
[Proefschrift] [Thesis] Groningen: University of Groningen, 1994.

8 Pollemans M
Kennistoetsing bij huisartsen [Testing of knowledge of GPs]
[Proefschrift] [Thesis] Maastricht: Maastricht University, 1994.

9 Kane MT
The assessment of professional competence
Eval Hlth Prof 1992; 15: 163-82

10 Ram P, Rethans JJ, Grol R, Vleuten CPM van der, Hobma S, Aretz K
Integrale toetsing: de voorspellende waarde van een simulatiespreekuur en kennistoetsen voor de kwaliteit van het dagelijks handelen [Comprehensive assessment: the predictive value of a simulation consultations and knowledge tests for the quality of daily practice]
Huisarts Wet 2000;43:103-10

11 Lamberts H, Wood M
ICPC: International Classification of Primary Care
Oxford: Oxford University Press, 1987

12 Leeuwen YD van, Mol SSL, Pollemans MC, Drop MC, Grol R,
Vleuten CPM van der
Change in knowledge of general practitioners during their professional careers
Family Practice 1995;12:313-17

13 Leeuwen YD van
Growth in knowledge of trainees in general practice. Figures on facts
[Thesis] Maastricht: Maastricht University, 1995

14 Tanenbaum SJ
Evidence and expertise: the challenge of the outcomes movement to medical professionalism
Acad Med 1999;74:757-63

15 Leeuwen YD van
De ervaringskennis van huisartsen [Experience-based knowledge of GPs]
Huisarts Wet 1998;41:80-84

16 Hobus P
Expertise van huisartsen. Praktijkervaring, kennis en diagnostische hypothesevorming [Expertise of general practitioners]
[Proefschrift] [Thesis] Maastricht: Maastricht University, 1994

17 Leeuwen YD van, Düsman H, Mol SSL, Pollemans MC, Drop MJ, Grol RPTM, Vleuten CPM van der
Factors influencing the growth in knowledge of trainees in General Practice
Advances in Health Science Education 2:61-70. Dordrecht: Kluwer Academic Publishers, 1997

18 Wensing M, Weijden T van der, Grol R
Implementing guidelines and innovations in general practice: which interventions are effective?
Br J Gen Pract 1998;48: 991-7

19 Campion-Smith C, Smith H, White P, Baker E, Baker R, Holloway I
Learners' experience of continuing medical education events: a qualitative study of GP principals in Dorset
Br J Gen Pract 1998;48:1590-5

20 Allery LA, Owen PA, Robling MR
Why general practitioners and consultants change their clinical practice: a critical incident study
BMJ 1995;314:870-4

21 Nutting PA, Franks P, Clancy CM
Referral and consultation in primary care: do we understand what we are doing?
J Fam Pract 1992;35:21-23

22 Boulay C du
From CME to CPD: getting better at getting better?
BMJ 2000;320:393-4

chapter 6

joint consultation sessions of GPs and cardiologists. objectives and experiences

Dutch version submitted as:

Gezamenlijk consulten van huisarts en cardiologen. Doelen en ervaringen

Vlek JFM, Vierhout WPM, Knottnerus JA, Schmitz JJF, Wesselingh-Megens AMK, Crebolder HFJM

abstract

objectives To investigate the objectives and experiences of GPs and cardiologists participating in a randomised trial 'Joint consultation of general practitioners and cardiologists in a primary care setting'.

design Descriptive

methods After the last follow-up consultations 51 GPs and 13 cardiologists completed the same questionnaire. In addition, data were obtained from the questionnaires filled in by the GPs about their own patients seen during the joint consultation sessions.

results For most GPs medical education was the main objective to participate in the project, and 85% of them reported that this goal had been achieved. For the cardiologists the main objectives were to improve collaboration with GPs and GPs' medical education; according to all of them the objectives were achieved. There were some barriers for the GPs to select patients, of which the randomisation procedure was the most important.
Overall the joint consultation was positively appreciated by 76% of the GPs and by 89% of the cardiologists.

conclusion As most of the aims of the participants have been achieved more or less, it is recommended to implement the joint consultation system on a broad scale.

keywords Joint consultation, general practitioner, cardiologist, objectives, experiences.

introduction The characteristics of the joint consultation have been described in chapter 3, see box 3.1. The aims of joint consultations are: providing good clinical care to the patient, reducing the number of unnecessary referrals to outpatient clinics, improving collaboration between GPs and cardiologists, and improving the expertise of the GPs about cardiac problems in general practice. From 1994 to 1998 a research project was carried out to study the effectiveness of joint consultation of general practitioners (GPs) and specialists for patients with suspected cardiac problems. A joint consultation project for cardiac problems was chosen because complaints

about the heart and heart diseases form an important problem for those who are concerned, in view of the high incidence (1) and prevalence (2), and the diagnostic uncertainty that is often experienced by GPs (3).

The results of this project, carried out as a randomised trial, are described in chapter 4. One of the findings was that the patients have much confidence in the joint consultation method. Whether the joint consultation can be offered as a regular service in future collaboration patterns between GPs and cardiologists depends, among other factors, on the experiences of these two groups.

To investigate these we studied the following questions:

- What objectives did the GPs and cardiologists have when they participated in the project, and to what extent have these objectives been achieved?
- What was the added value for the GP of the discussion about each selected patient?
- Did the collaboration in general between GPs and cardiologists in the region improve as a result of the personal meetings between them?
- What kind of problems did the GPs and cardiologists experience in organising the actual sessions?
- What were the experiences of the GPs with the study design and methods?
- What are the opinions of the GPs and cardiologists about the joint consultation working method?

methods

After the last follow-up joint consultation that occurred about 15 months on average after the group consultations, the GPs and cardiologists completed a questionnaire (for both the same).

To answer the second question we used data from the questionnaires that the GPs filled in about each patient that was seen during a joint consultation session. Regarding the added value gained from the joint consultation about every specific patient, the GP could choose from the following categories: more diagnostic certainty, more certainty about the management of this case, growth of knowledge, prevention of referral, reassurance of the patient, useful second opinion, other value, or no value at all.

results

The questionnaire was completed by 51 of the 56 initially participating GPs. The characteristics of this group, such as age, years of practice as a GP, and practice setting, are described in table 6.1.

table 6.1. **age, years of experience in practice and practice characteristics of the participating GPs, percentages**

n=51		%
age	< 30 years	4
	30-39	21
	40-49	63
	> 50	12
experience in practice		
	< 5 years	16
	6-10	16
	11-15	20
	16-20	30
	> 20	18
practice characteristics		
	solo	38
	partnership	29
	health centre	33

The group consisted largely of experienced GPs: 75% had been in practice for more than 10 years. Seventy percent were working full time; and 58% had an electrocardiograph in the surgery. Of all 13 participating cardiologists, 9 (=70%) completed the questionnaire. Like the GPs, they were an experienced group: 66% had been practising as cardiologists for more than 10 years.
The aims of the participants are shown in table 6.2, which also indicates the extent to which participants think their aims were achieved. Both GPs and cardiologists could choose from a list of pre-defined aims. For the GPs medical education was the main objective, and for the cardiologists improving the collaboration. Of the GPs' aims achieved, the reduction of the referral rate had the lowest score, while reassurance of the patient and decrease of the diagnostic uncertainty the highest score. As for the cardiologists, the reduction of the referral rate too had the lowest score, while improving collaboration and medical education had the highest score.

objectives of the participating GPs (n=51) and cardiologists (n=9) at the start of the project, and the extent to which they were achieved (percentages). more than one objective could be indicated table 6.2.

objectives	general practitioners		cardiologists	
	indicated	achieved yes or doubt	indicated	achieved yes or doubt
	n	%	n	%
medical education GP	49	85	8	100
reducing diagnostic uncertainty	42	87	8	87
improving treatment possibilities	39	71	5	80
improving collaboration	39	69	9	100
getting a second opinion	38	85	5	80
reassuring patient	32	88	8	88
reducing referrals	25	56	6	66

All 148 joint consultation cases gave their GP some added value, mostly more diagnostic certainty, and in somewhat fewer cases more certainty about further treatment (table 6.3).
Table 6.3 indicates for which diagnoses each choice is applied.

added value (for the GP) of cases discussed*, and for each the most frequently mentioned diagnoses table 6.3.

n=148 cases	%	
more diagnostic certainty	62	valve disorders murmurs angina pectoris
more certainty about treatment	59	heart failure atrial fibrillation hypertension
growth of knowledge	44	valve disorders atrial fibrillation paroxysmal rhythm disorders
second opinion	34	hypertension
reassurance of the patient	27	paroxysmal rhythm disorders
referral could be prevented	23	functional murmurs

* GPs could choose more than one possibility

The direct, personal meeting of the GPs and cardiologists was appreciated by all cardiologists and by 91% of the GPs. Eighty-four percent of all GPs found that the collaboration in general between the GPs and the other regional

cardiologists had not improved, in contrast to 55% of the cardiologists who found that it had indeed improved.

Organising the joint consultation sessions, actually done by the groups themselves, was (rather) easy, according to 76% of the GPs and all cardiologists. The other GPs felt that the planning had sometimes been difficult.
Almost all participants mentioned that at least once a joint consultation session had had to be cancelled, mostly because a proper case could not be selected. The number of sessions held by the different groups varied considerably, from 1 to 16, with an average of 7 sessions. In addition, the GPs mentioned some obstacles:

- 67% of them concluded that the time between two sessions was too long for some patients
- 84% mentioned that sometimes there were too few patients to be selected.

Half of the GPs found that their participation in the project entailed no specific burden in daily work, and for the others this was indeed more or less the case. Of the cardiologists 44% found their participation somewhat burdening and for one of them this was a great burden.
According to 55% of all participants, the optimal length of a session was one hour, with the maximum length of 1.5 hours; they found that at most 3 patients could be discussed in one session. In addition, during almost all sessions general cardiac subjects were discussed in connection with the patients in question.

Specifically, GPs indicated some barriers with regard to the study design:

- 85% of the GPs found that on at least one occasion the randomisation was an obstacle to invite a patient
- 33% mentioned the length of the questionnaires.

The cardiologists also reported some obstacles: 33% of them mentioned the questionnaires, and 44% the small number of proper patients.

Most of the GPs (76%) gave a positive appreciation of the study; 13% rated it negatively. The majority (67%) would like to continue their participation in joint consultation sessions for patients with cardiac complaints, while 89% would like to do so for patients with complaints of other tracts. As for the cardiologists, 89% judged the joint consultation, as a new working method, to be a gain for the patients and GPs, and 66% judged it so for themselves.

Eighty-nine percent would like to continue their participation, with 66% in favour of institutionalising the joint consultation as a structural health care method. The possibility of referring back a patient to primary care by way of a joint consultation should be a condition.

discussion

The joint consultation working method was positively appreciated by the GPs and the cardiologists. The response on the questionnaires was good, although 30% of the cardiologists did not respond in spite of a reminder. So maybe those responding indicates a positive selection. It should be remarked that the questionnaire was administered at the end of the project: there was no inventory of expectations at the beginning. All of the GPs could determine their own output by selecting patients and participating in the discussion. The fact that 85% of the GPs found that educational goals were attained can be seen as an affirmation of this view. The GPs learned a lot more than merely about the patients under discussion. The importance of the joint consultation as a medical education method was confirmed by the cardiologists. To gain more diagnostic certainty was an objective for 80% of the participating GPs. Most of them succeeded, in both their own opinion and that of the cardiologists.
The direct personal contact of GPs and cardiologists during the joint consultation sessions was positively appreciated by most of them. Nevertheless, the GPs judged that the regional collaboration has not improved. More than half of the cardiologists judged the opposite. We cannot fully account for this difference. Yet, for the GPs, having good personal contact with one cardiologist does not have such an impact that collaboration with other cardiologists improves too. This view can be partly explained by the fact that in some regions the cardiologist-consultant was not practising in the same region. This suggests that joint consultation only should be held with consultants who are working in the same area as the GPs and that as many members of a partnership as possible should be concerned. Besides, to achieve an improvement in the collaboration within one region, joint consultation sessions should be held on a sufficiently large scale.

Only a small majority thought that the number of referrals were reduced. This view is not in line with the finding of another joint consultation project that indeed led to a significant reduction of the number of referrals in the participating practices (4), nor with the findings in our project in which a 10% reduction of the referral rate was achieved, as discussed in chapter 8.

The organisation of the sessions generally did not cause any problems. Sometimes sessions had to be cancelled because the GPs could not select appropriate patients. Cancellation sometimes meant that the time between two sessions was too long. Undoubtedly, this led to the referral of some patients who could very well have been selected for the joint consultation project. The great variation of the number of sessions held by each group suggests that GPs or group-related factors like motivation, involvement, experienced burden of daily work, rather than too few appropriate patients, were the cause. The randomisation in the study design was found to be a big barrier. The GPs often chose direct referral to the outpatient clinic instead of selection for the project because of the 50% chance that the patient would be assigned to the control group. This problem is discussed more extensively in chapter 7. This study design then led to a sub-optimal use of the joint consultation method, which had a negative effect on the results of this evaluation. In spite of this design dilemma, it is important not to cease carrying out this type of survey to achieve care innovation that is evidence-based.

In sum, it can be stated that the different aims of the study have more or less been achieved, that the GPs got more diagnostic certainty, and that there has been an important educational effect. The personal contact has been appreciated, but this has not always led to an improvement in the regional collaboration of GPs and cardiologists. There was a sub-optimal use of the joint consultation, to a large extent due to the study design. Nevertheless the joint consultation has been positively appreciated, as in other projects (4-6). It is recommended to implement the joint consultation system more broadly and to continue this working method as a structural health care facility.

references

1 Okkes IM, Oskam SK, Lamberts H
Van klacht naar diagnose. Episodegegevens uit de huisartspraktijk [From complaint to diagnosis. Data of episodes in general practice]
Bussum: Uitgeverij Coutinho, 1998

2 Lisdonk EH van de, Bosch WJHM van den, Huygen FJA, Lagro-Janssen ALM
Ziekten in de huisartspraktijk [Diseases in general practice]
Utrecht: Bunge, 1994

3 Vlek JFM, Esch HWMJ van, Verest LFHM, Vierhout WPM, Crebolder HFJM
Cardiale problemen in de huisartspraktijk: een inventarisatie [Cardiac problems in general practice: an inventory]
Hart Bull 1997;28:55-9

4 Vierhout WPM, Knottnerus JA, Ooij A van, Crebolder HFJM, Beusmans GMHI, Pop P, Wesselingh-Megens AMK
Effectiveness of joint consultation sessions of general practitioners and orthopaedic surgeons for locomotor system disorders
Lancet 1995;346:990-4

5 Schuurman W, Everdingen JJE van, Schadé E
De dermatoloog in de eerste lijn. Verslag van een nascholingsproject [The dermatologist in general practice. Report of a medical education project]
Huisarts Wet 1992;35:161-3

6 Boer F den, Hageman GCHA, Waal MWM de, Petri H
Het gezamenlijk consult in de eerste lijn. Een alternatief voor verwijzen naar de tweede lijn? [The joint consultation in primary health care. An alternative for referral to specialist care?]
Medisch Contact 1996;51:221-3

chapter 7

patients referred to the cardiologist versus patients selected for joint consultation: are there differences?

Submitted as:

Patients referred to the cardiologist versus patients selected for joint consultation: are there differences?

Vlek JFM, Schmitz JJF, Vierhout WPM, Knottnerus JA, Wesselingh-Megens AMK, Crebolder HFJM

abstract

background To study the effect on the quality of care and on the referral rate, a randomised controlled trial of joint consultation sessions of small groups of GPs and a cardiologist was conducted. A number of patients who might have been suitable for the joint consultation were not included in the trial but referred directly.

objective To find out why and to what extent the GPs chose direct referral instead of joint consultation.

methods The study was conducted retrospectively in the two main districts of the trial. All patients who were referred directly were traced at the outpatient clinics. The GPs completed a questionnaire about the kind of complaint or disorder and the motives for the referral of each patient. Data about the diagnosis were obtained from the cardiologist's file.

results Data of 129 of 226 patients (57%) could be analysed. In both the referred group and the joint consultation group the variety of complaints and disorders was similar. The referred patients were older than the joint consultation patients. In the referred group 36% of the patients did not have a cardiac disorder: patient's anxiety was the main motive. According to the GPs, 23% of the referred patients were suitable for the joint consultation in retrospect. In those cases the study design was the main reason to choose referral.

conclusion The study design was the main reason why the GPs did not make optimal use of the joint consultation: more patients might have been included, especially when anxiety was a reason to refer. The purpose of the joint consultation as a proper method to reassure the patient should be emphasised. A greater reduction of unnecessary referrals seems feasible, resulting in an even greater substitution effect.

key words Joint consultation, referral, general practitioner, cardiologist, substitution.

introduction A general practitioner (GP) has several options for dealing with non-acute cardiac complaints and disorders. If he feels certain enough about the diagnosis and the proper treatment, he can decide to deal with the problem himself. If not, he will have to refer the patients in question. There will be some overlap between the patients he will be able to treat himself and those who will be referred. Some of the GPs' referrals to the cardiologists are likely to be unnecessary, as has been found in studies concerning referrals to other specialists (1-3). A randomised controlled trial (RCT) 'Effectiveness of joint consultation sessions of general practitioners and

cardiologists in a primary care setting' was conducted to study the effects of joint consultation on the quality of care and on the referral rate. We expected that some referrals, particularly those showing the 'overlap' problems described above, could be prevented by the joint consultation. While carrying out the RCT it was observed that patients suitable for the study were not included but directly referred to the cardiologist. There were several reasons for the GPs to do so. The participating GPs had to invest time in informing the patient and in completing questionnaires. There was the chance too that the patient would not be able to participate in the consultation session due to the randomisation procedure. Therefore a separate study was done to find out why and to what extent the GPs chose direct referral instead of joint consultation.

patients and methods

The design of the RCT and the characteristics of joint consultation are described in chapter 3 (box 3.1) of this thesis.

The separate study about the directly referred patients was carried out retrospectively in the two main districts of the RCT: the outpatient clinics of the University Hospital Maastricht and of the St. Joseph Hospital at Veldhoven in the Eindhoven district. These two districts comprised almost 70% of all GPs participating in the trial. The patients of the participating GPs who had been referred directly for the first time in the period October 1995 till July 1996 were traced at the outpatient clinics. Patients who had been referred as the result of a joint consultation were excluded, as well as those referred because of acute or life-threatening complaints and those who had been referred by physicians other than their own GPs.
After obtaining written consent of the patient, the GP was asked to complete a questionnaire and the cardiologist's file was studied. The following data were gathered: type and seriousness of the complaint or disorder, motives for the referral, the reason why the patient had not been selected for the joint consultation, and whether or not the GP judged in retrospect that the patient could have been invited for a joint consultation, and the cardiologist's diagnosis. Complaints and diagnoses were classified according to the International Classification of Primary Care (ICPC) (4).

analysis

The following data were used to compare the referred patients with the joint consultation patients:

- age and sex
- type and seriousness of complaints and disorders (according to the GPs)
- the GPs' motives for referral or selection for the joint consultation
- cardiologists' diagnoses at the outpatient clinic, or established during the joint consultation.

The data management and analysis were carried out using SPSS.

Between group comparisons for continuous and discrete variables were carried out using t-test and chi-square test respectively, in all cases two-sided, with a significance level $p = 0.05$.

results

At the outpatient clinics 226 patients could be traced: 110 in Maastricht and 116 in Veldhoven.

The data of 129 patients (57%) could be analysed; the other 97 patients had to be excluded for one of the reasons mentioned above or because we did not succeed collecting the necessary data or we did not get the patients' permission to send the questionnaire to their GPs.

Table 7.1 presents baseline characteristics of the patients. The joint consultation group consists of all patients in the Maastricht and Veldhoven districts who were included for the trial. They were younger than those of the referred group.

characteristics of patients referred to the outpatient clinic and of the patients participating in the joint consultation project table 7.1.

		referred patients n=129 %	joint consultation patients n=194 %
sex	male	46	43
age	< 20 years	0*	8*
	20 – 40	10	13
	40 – 60	41	34
	60 – 80	44	38
	> 80	5	7

*p <0.01

As table 7.2 shows, the majority of the reported complaints of the referred patients are similar to those of the joint consultation group. The percentage considered serious by the GP is given for each category. In the referred group the patients with dyspnoea and heart murmur are considered more serious by their GPs than those in the joint consultation group.

most frequently reported complaints of referred versus joint consultation patients and the percentage considered serious, according to the GP table 7.2.

complaint	referred n=129 %	patients serious %	joint consult. n=194 %	patients serious %
chest pain	32	55	26	41
palpitations	11	36	23	40
dyspnoea	8	80*	9	35*
heart murmur	6	63*	10	16*
abnormal ECG	6	25	1	–
fatigue	5	43	8	40
other	32	21	26	34

consult. = consultation
* Fisher's Exact p <0.05

In 36% of the referred patients no heart disease was diagnosed (table 7.3). Half of this group consisted of patients who had been referred with chest pain. Of all referred patients with chest pain 56% had no heart disease according to the cardiologist. Notably, when the GP had already diagnosed a heart disease before referral, the diagnosis was often correct, as is shown in the categories angina pectoris and atrial fibrillation.

table 7.3. **the complaints and disorders as noted by the GPs and the number of diagnoses made by the cardiologist, matching or not matching these complaints and disorders**

GP note		diagnoses of cardiologist			
complaint or disorder	n	diagnosis matching complaint	n	other diagnoses n	no heart disease n
chest pain	41	coronary heart disease*	15	3	23
palpitations	15	rhythm disorders*	6	3	6
dyspnoea	10	heart failure	2	6	2
murmurs	8	valve disorders	6	1	1
ECG abnormal	8			6	2
fatigue	7			4	3
angina pectoris	6	CHD*	5	1	
atrial fibrillation	6	atrial fibrillation	6		
heart failure	2	heart failure	1	1	
valve disorder	2	valve disorder	2		
others	24			14	10
total	**129**		**43**	**39**	**47**

* CHD, coronary heart disease: ICPC codes for angina pectoris, myocardial infarction and ischaemic heart disease together; rhythm disorder: ICPC codes for (paroxysmal) supraventricular tachycardia and extra-systolia and atrial fibrillation

Table 7.4 summarises the reasons for referral mentioned by the GPs and for selection for the joint consultation group. In both groups diagnostic uncertainty was the main motive, in the joint consultation group even to a greater extent. Most remarkable is the percentage of the patients with 'anxiety' or 'defensive reason' in the referred group. This was especially salient in the categories 'chest pain' (46% of cases) and 'palpitations' (53% of cases). The seriousness of the complaint was mentioned as a reason to refer in 50% of the dyspnoea cases and the patients with angina pectoris and heart failure.

reasons for referral versus joint consultation mentioned by the GPs table 7.4.

reason for referral	referred patients n=129 %	joint consultation patients n=194 %
uncertain about diagnosis	29	38
uncertain about therapy	7	22**
uncertain about diagnosis and therapy	23	36*
insufficient expertise GP specialist involvement necessary because of the seriousness	9	#
anxiety patient/ defensive reasons	22	#
patient already known by cardiologist	41	19**
others	11	#
	4	1

more than one reason per patient could be mentioned

these items were not mentioned in the questionnaire for the GP in the joint consultation project

* $p< 0.02$

** $p <0.01$

The GPs were asked whether they had considered selecting the referred patients for the joint consultation (table 7.5). In 44% of the cases the GPs stated that they had considered a joint consultation and in 23% they might have selected the patients for the joint consultation in retrospect.

The GPs listed the reasons (not in table) why they had not included the patients they had considered suitable for joint consultation (more reasons could be mentioned): avoidance of the randomisation procedure was mentioned in 34% of the cases; the period till the next joint consultation session was considered too long (28%); the case was not right on second thoughts (25%); the patient refused participation (9%); other reasons, or unknown (22%).

table 7.5. **categories of patients considered for joint consultation inclusion before and after referral**

complaint or disorder n=129	n	joint consultation considered by GP preceding referral %	joint consultation considered by GP in retrospect %
chest pain	41	56	27
palpitations	15	53	13
dyspnoea	10	20	20
murmurs	8	50	37
ECG abnormalities	8	75	12
fatigue	7	29	14
angina pectoris	6	50	17
atrial fibrillation	6	17	–
heart failure	2	–	50
valve disorders	2	100	100
others	24		
average whole group referred patients		44	23

discussion

The referred and joint consultation groups are similar in the variety of complaints with chest pain as main category. The referred group comprised more older patients, more serious patients with dyspnoea and heart murmur, more patients with the diagnosis 'no heart disease', and more patients for whom anxiety was a reason to refer. In retrospect almost a quarter of the referred patients might have been selected for the joint consultation.
Of the patients in our study referred with chest pain, 37% had Coronary Heart Disease (CHD), while 56% had no heart disease. Probably the referred group of chest pain patients consisted of a great number of atypical cases. In the literature a plea has been made for a diagnosis in those cases to be made ideally by the GP (5). The GP doubting about the nature of the chest pain of his patient should consider a joint consultation in order to select those who are at high risk and need further investigation and to reassure the others. In this way the joint consultation might be a proper alternative for the recently presented rapid cardiologic assessment services that aim to prevent the unnecessary admission of chest pain patients (6).

Although patient's anxiety was one of the inclusion criteria for the joint consultation project, this was significantly more often a reason to refer while quite a number of these patients did not have a heart disease. Probably GPs are more inclined to opt for a referral when a patient is anxious or when there is pressure from the patient to refer (7,8).

The joint consultation method is a very appropriate way of working to reassure anxious patients in the light of the strength of confidence that the patients reported in this method (9). Did the GPs underestimate this possible effect of joint consultation or did they overestimate the possibilities of the outpatient clinic compared to joint consultation? In this respect the randomisation procedure has probably been an important, confounding factor. The GPs sometimes indicated that they had chosen referral because of the chance that the patient, if selected for joint consultation, would have been assigned to the control group. So in those cases the GP opted for 'certainty'.

The GPs have not made optimal use of the joint consultation: more patients might have been included, especially those with chest pain, palpitations or fatigue. We conclude that a greater reduction of unnecessary referrals to the outpatient clinics seems feasible, especially when there is no randomisation procedure as would be the case in normal circumstances. The result will be a greater substitution effect. This confirms the recommendation of Vierhout et al. to consider more frequently the joint consultation system as an option to improve the efficiency of care (6).

references

1 Jenkens RM
Quality of general practitioners' referrals to outpatient departments: assessments by specialist and general practitioner
Br J Gen Pract 1993;43:111-3

2 Donohoe MT, Kravitz RL, Wheeler DB et al.
Reasons for outpatient referrals from generalists to specialists
J Gen Intern Med 1999;14:281-6

3 Engelsman C, Geertsema A
De kwaliteit van verwijzingen [The quality of referrals]
[Proefschrift] [Thesis] Groningen: University of Groningen, 1994

4 Lamberts H, Wood M
ICPC International classification of primary care
Oxford: Oxford University Press, 1987

5 Okkes IM, Oskam SK, Lamberts H
Van klacht naar diagnose. Episodegegevens uit de huisartspraktijk [From complaint to diagnosis. Data of episodes in general practice]
Bussum: Uitgeverij Coutinho, 1998

6 Chambers J, Bass C
A typical chest pain: looking beyond the heart
QJM 1998;91:239-44

7 Armstrong D, Fry J, Armstrong P
Doctors' perceptions of pressure from patients for referral
BMJ 1991;302:1186-8

8 Krol LJ
De consument als leidend voorwerp in de gezindheidszorg: onderzoek naar achtergronden en verwijzingen naar de kinderarts [The patient as leading object in health care: study of backgrounds and referrals to the pediatrician]
[Proefschrift] [Thesis] Amsterdam: University of Amsterdam, 1985

9 Vierhout WPM, Knottnerus JA, Ooij A van, et al.
Effectiveness of joint consultation sessions of general practitioners and orthopaedic surgeons for locomotor-system disorders
Lancet 1995;346:990-4

chapter 8

decreasing trends in referrals and costs for patients with coronary heart disease as a result of joint consultations

Dutch version submitted as:
Dalende trends in verwijzingen en kosten bij CHZ door Gezamenlijke Consulten
Vlek JFM, Winter J, Vierhout WPM, Schmitz JJA, Knottnerus JA, Crebolder HFJM

abstract

objectives To investigate whether joint consultations prevent referrals and whether cost saving can be achieved.

design Descriptive trend analysis

methods Data were obtained from the two main regional health insurance companies on the cardiac and total referral rates of 44 GPs who, in 15 groups, participated in the randomised trial 'Joint consultation of GP and cardiologist in primary care setting' and of their colleagues in the same areas. The percentage of the cardiac referrals on the total number was calculated per year, and the proportional differences between 1994 and 1997 were tested using the paired t-test.
For the costs assessment, 'A simulation model for future analysis of coronary heart disease' was used. Cost saving is achieved when the costs of the patients under GP's control are lower than those of referred patients minus the cardiologist's fee.

results Each year 10% fewer patients were referred, that is 40 patients fewer per joint consultation group of 3 GPs. The differences of the proportions are significant ($p = 0.024$).
Re-calculated on CHD patients, a saving of 7400 guilders per group of 3 GPs per year could be achieved.

conclusion Joint consultations for patients with cardiac complaints cause a reduction of the referral rate to the extent that they are cost effective.

keywords Joint consultation, reduction of referral rate, cost saving.

introduction During a joint consultation session patients with (possible) cardiac complaints are examined and discussed by a group of 3-5 GPs and a cardiologist-consultant. The patients are selected by their GP, mostly because of uncertainty about the diagnosis or treatment. This method that was studied in the trial 'Joint consultation of GP and cardiologist in primary care setting' provides good care and improves the collaboration between GPs and cardiologists. See chapter 3 for a full report of the trial. One of the constraints of the joint consultation system is that only few patients can be discussed. In each cycle of a maximum of 10 sessions per year lasting 1.5 hours

each 40 patients can be seen (with an average of 4 patients per session). Each GP in a group of 4 can select an average of only 10 patients. Nevertheless, the importance of the system as method of continuing medical education must be underlined. By participating in joint consultation sessions the GPs get a better grip on the problems they meet in daily practice, and thus gain greater certainty about their performance. This might be important because GPs' diagnostic uncertainty that is often a reason to refer a patient (1). One of the aims of the joint consultation method is to improve the diagnostic process.
We expected that participating in joint consultation sessions characterised by continuous medical education changes the GP's performance on cardiac problems and reduces the referral rate of cardiac patients in his practice population; this can be seen as a substitution effect. In some recent studies on the effects of joint consultation with other specialities such a reduction in the referral rate has been found (2,3). Its relevance is clear in the light of the percentage of unnecessary referrals that the report 'Readiness to change' of the Committee of Structure and change of Health care has assessed as about 30%. A second limitation of the joint consultation system is its time-consuming character. In each cycle of 10 sessions a year each GP invests about 15 hours. For the cardiologist each session lasts about 2 hours, time for travel from hospital to the GP's surgery included. For the cardiologist the time investment per patient is about half-an-hour, which is much more than the time reserved for a new patient in the out-patient clinic (usually 15 minutes). So it is questionable whether these investments are time and cost effective. Clarity about these aspects is vital if the joint consultation system is to be considered feasible as a regular service in health care. This has led us to the following questions:

- Is the referral rate in general practices decreasing due to the participation in a joint consultation cycle?
- Can a cost saving in the Coronary Heart Disease (CHD) care be achieved due to joint consultation?

methods

To answer the first question we approached the two main health insurance companies in the areas in which the project was carried out: Zorgverzekeraar VGZ and CZ-Groep Zorgverzekeringen. They were asked to give data on the

total number of referrals and the cardiac referrals of the GPs who participated the joint consultation project from 1994 to 1997, the full duration of the project. The first joint consultations started in 1994; the last area started in 1995. The mean cycle lasted 1.5 years with a follow-up period of 1.25 years after the last group joint consultation. The data on referrals comprise a period including the intervention and the follow-up of the trial that was carried out in 5 areas. In this report one of these is divided in two sub-areas, so the data of 6 areas is discussed.
The two health insurance companies delivered the data on referrals of 45 of 49 participants and of all other GPs in the various areas. The data refer to sick fund patients of the companies who are calculated to be about 60% of the practice population of the participating GPs. Because there is no reason to hypothesise that the patients insured with another company or the privately insured patients are treated differently by their GPs, the available data is held to give a proper reflection of the referral patterns of the participating GPs and of their colleagues in the same areas as well. Trends in these patterns of the participants during the course of the trial could be compared well with the patterns of all GPs in the various areas. We will express them in two ways: of each group the mean number of cardiologic referrals per participating GP per 1000 patients per year will be given as well as the mean number of cardiological referrals per area GP. Moreover the proportion of the cardiac referrals of the total amount of referrals will be calculated for each group and for the reference area of each group. In the statistical analysis the differences of these proportions between 1994 and 1997 were calculated for the consultation groups and compared with their areas. This yields a number of pairs of data of which the significance was assessed by the paired t-test.

The trial design did not allow us to calculate the true costs, so to answer the second question we used the approach of a model: 'A simulation model for future analysis of coronary heart disease' (4). This validated model includes the global description and calculation of various medical programmes related with the various stages of CHD, namely angina pectoris NYHA classification 1-2 (AP 1-2), angina pectoris NYHA 3-4, unstable angina pectoris (UAP), acute myocardial infarction (AMI) and sudden cardiac death (SD), i.e. death within one hour after AMI. Account is taken that patients may change from one to another category depending on the course of the disease and the extent of the therapeutic results.

When CHD is suspected, a pre-clinical stage is distinguished, i.e. the period between the first complaints or manifestation of CHD and a more critical stage in the course of CHD, during which mostly clinical diagnostics and observation are necessary. The pre-clinical stage concerns patients with suspected CHD with or without angina pectoris, hence a group of patients similar to those selected for the joint consultation because of possible complaints of AP. In the trial this group formed the main patients' category. Thus, this category was thought to fit the model very well for our purposes.

In the model a cost-price is calculated for each of the various scenarios in the pre-clinical stage, including costs of consulting, of medication and of additional testing, namely: electrocardiography (ECG), blood, x-ray and non-invasive specialist tests like echocardiography, exercise testing, holter investigation and nuclear testing. In the calculations we leave the medication costs out of account, because we suppose that the GP and the cardiologist come to a similar prescription decision based on the same arguments. So the costs will be the same whether the GP or the cardiologist is the 'prescriber'. This was the point of view in the model too.

The calculation in the model is based on the chance that a specific investigation is carried out, which is based on the performance profile of investigations at the cardiologic out-patient clinic. The cost-price per patient is determined by summing the cost-process of the various investigations multiplied by the chance that each of them will be performed. The calculations of the model were as far as possible actualised on the price-level of 1996 by one of the authors (JW). In our approach rates are used instead of real costs, which is a second-best when the latter are not available (5). See table for an explanation of the differences. The assessment of the cardiologists' salary is extracted from the literature (6).

table 8.1. **cardiology referrals per intervention group versus the region, number per 1000 insured; proportion of cardiology referrals of the total number of referrals per intervention group versus the region x 100**

	referrals cardiology			referrals cardiology/total, x 100	
region 1	interv. group	region		interv. group	region
1994	42	48		8.8	8.4
1995	43	46		8.9	8.8
1996	37	47		8.2	9.2
1997	39	47		8.1	9.3
			'97-'94	- 0.7	+ 0.9
region 2	interv. group	region		interv. group	region
1994	51	46		8.8	7.7
1995	52	45		8.5	7.4
1996	49	43		7.8	7.1
1997	40	48		7.4	7.6
			'97-'94	- 1.4	0.1
region 3*	interv. group	region		interv. group	region
1994	–	–		–	–
1995	37	46		8.5	8.9
1996	35	47		7.9	9.1
1997	36	47		8.0	9.0
			'97-'95	- 0.5	+ 0.1
region 4	interv. group	region		interv. group	region
1994	41	41		not available	
1995	40	45		id.	
1996	40	50		id.	
1997	37	45		id.	
region 5	interv. group	region		interv. group	region
1994	45	49		8.7	8.1
1995	50	54		9.9	8.9
1996	48	53		9.6	8.8
1997	47	53		9.0	8.8
			'97-'94	+ 0.3	+ 0.7
region 6	interv. group	region		interv. group	region
1994	53	47		10.4	9.4
1995	54	49		10.7	9.4
1996	54	53		11.1	9.7
1997	58	57		10.7	10.2
			'97-'94	+ 0.3	+ 0.8

paired t-test (2 tailed): p = 0.024
(difference '97-'94, for all regions)

interv. = intervention

* in this region the participating group was not yet a partnership in 1994

results

trends of referral rates

Of 15 of the 16 GPs' groups we could trace the referral data, and of all areas. However, for one area data were incomplete because we did not manage to trace the data of one group. In area 3 we could not trace the referral data of 1994 because this group started a partnership in 1995, the year in which this group started the joint consultations, while in area 4 we could not calculate the proportion of the cardiologic referrals of the total. See table 8.1 for the results in the various areas.

The proportional differences between the intervention group and the respective areas are significant: $p = 0.024$ (paired t-test). At the start of the project in 1994 the average number of cardiologic referrals is in the intervention group somewhat less than the average in the areas. This difference increases to an average of 6 referrals per 1000 patients per year in favour of the GPs of the intervention group. This means a reduction of more than 10% of the number of yearly referred patients per standard practice, i.e. 56 referrals prevented in a group of 4 GPs who participate joint consultations. Assuming that not every GP has a standard practice, this number will be rounded to 50 in further calculations. A group of 3 GPs will be able to prevent referral in about 40 patients.

simulation model CHD

In the model it is assumed that in 60% of the patients with a possible CHD, no cardiac cause of the complaints can be found (further in this article these patients will be described as healthy). The remaining 40% come into medical, specialist care.
In table 8.2 the costs (actualised for 1996, see table 8.3) are outlined for the patient with a first manifestation of possible CHD who appears eventually to be healthy or to have AP1-2.

table 8.2. costs of the patient with a first manifestation of possible CHD

	GP	cardiologist
'healthy' patient	105 guilders **a**	422 guilders **b**
patient with AP1-2 (without admission in hospital)	140 guilders **c**	536 guilders **d**

In the case of the 'healthy' patients, the costs of 2 consultations at the GP's surgery or the out-patient clinic have been taken into account, plus the costs of some blood testing for the patients in group a and the costs of blood testing and additional specialist tests for the patients in group b. Patients with the diagnosis AP1-2 will be seen three times a year by their GP, group c, or cardiologist, group d. The costs are calculated per year. The costs of group d are calculated by summing the following elements: costs of the first consultation including additional testing, costs of the second consultation (consultation + ECG), and the costs of the third consultation (consultation + additional tests). In this scheme the medication costs have been left out of account.

The additional costs of the patient referred to a cardiologist instead of being treated by his GP can be read from the scheme. We indicated above that a group of 4 GPs participating in a joint consultation cycle will refer 50 fewer patients a year. If all these were patients with a possible CHD, of whom 60% are finally healthy and 40% have AP1-2, the cost saving could be 17430 (rounded to 17400) Dutch guilders per group per year. This amount is calculated as follows: [50 x (b-a) x 0.6 + 50 x (d-c) x 0.4]. When 40 referrals are prevented, this amount will be [40 x (b-a) x 0.6 + 40 x (d-c) x 0.4] = 13944 Dutch guilders (rounded to 13900).
How is this cost saving in proportion to the costs of the joint consultation? When a cardiologist participates in a joint consultation cycle, his time investment determines the costs. One joint consultation cycle of 10 sessions a year lasting 2 hours each means a time investment of about 0.0125 ftp [1 ftp : 10 (months): 4 (weeks):2 (day-parts)]. The fee of 0.0125 ftp cardiology is about 6543 guilders a year. So the gross cost saving ranges from about 7400 to 10900 guilders per group per year.

comparison of cost calculation 1988 (Vrieze et al.) and 1996 (JW), guilders

table 8.3.

	1988	1996
GP, healthy patient		
consultation, 2 x	54	70
diagnostics, blood test	15.80	35.20
tota	69.80	105.20 **a**
GP, patient AP1-2		
consultation, 3x	81	105
diagnostics, blood test	15.80	35.20
total	96.80	140.20 **c**
cardiologist, healthy patient		
consultation	54	20.39
follow-up consultation, 2x	28	7.96
referral card, short, 65% sickfund		60.61
diagnostics 1 *	366.85	332.92
total	448.85	421.88 **b**
cardiologist, patient AP1-2		
consultation	54	20.39
follow-up consultation, 2x	56	15.93
referral card, long, 65% sickfund		72.64
diagnostics 1 + 2 **	515.25	426.65
total	625.25	535.60 **d**

* specification diagnostics 1

diagnostics 1	% #			% #
ECG	100	51	33.70	100
ergometry	75	90.75	94.42	85
blood test	75	74.25	32.81	75
x – ray thorax	75	44.25	12.32	15
thallium scan	10	72	94.23	10
echocardiography	20	34.60	65.44	50
total		366.85	332.92	

** specification diagnostics 2

diagnostics 2	% #			% #
ECG 2x	200	102	61.54	200
holter	20	46.40	35.11	20
total		148.40	96.65	

percentage of cases in which the specified investigation will be carried out

discussion

A 10% reduction of the referral rate cardiology has been achieved by the GPs. If this reduction all concerned patients with a (possible) CHD, a significant cost saving could be realised too.

Some methodological remarks must be posed. The calculation of the cost saving is based on some premises. First, we used a model; we did not collect data on real costs prospectively. Our premise is that the model was sufficiently validated and representative for the normal procedures. The out-patient course described in the model has been changed slightly in 1996 for the percentages of the cases in which the various test have been carried out, but this did not make a difference in the assessments of total costs.

One might think that for other cardiac disorders a similar figure can be outlined. The diagnostic procedures for patients with complaints of the heart rhythm, possibly leading to diagnoses like paroxysmal supraventricular tachycardia or paroxysmal extrasystoly, are not likely to show much variation in general. A patient with these types of complaints who is referred to the cardiologist will, after the first consultation, undergo some additional testing and return for a second consultation at the out-patient clinic to discuss the results of the testing. This diagnosis category was in the trial the second largest group. The CHD model might apply a big group of patients who have been selected for joint consultation.

The costs of electrocardiography in general practice were omitted from the model. Though the AP standard of the Dutch College of GPs advises not to do so (7), some ECGs will be made in general practice. Their costs should be summed up on the GP's side of the above scheme. But GPs who have an ECG facility in their surgery will use this in the diagnostic process which is the case for about one third of the incident AP –cases, of whom almost 40% will normally be referred (1). So in many cases these costs will have to be counted on the specialist side.

In the Dutch health care system each referral is preceded by consultation with a GP, which is not the case for the patients who visit the emergency department of the hospital directly. The costs of the GP's diagnostic process of patients who are referred should be counted at the specialist side too. So the real cost differences might be even greater than we calculated.

On the other hand, we know that joint consultation cause referrals that would not otherwise have been occurred. Probably these cases are relatively more

serious, and the referral reduction is achieved in the patient groups with less serious disorders. Joint consultations contribute to a better selection of patients who need secondary care, which will increase costs in the group of referred patients. Nevertheless, one might suppose that the patients who wrongly are not referred will have to be referred in a latter, much more severe phase with higher costs. Investigation of this kind of effect was not within the scope of this project.
When a patient with AP 1-2 is under the control of a GP instead of the cardiologist, as long as the AP remains stable (in the model: 7 years on average), the yearly cost savings as calculated above accumulate for those years to a much higher level. The follow-up period of the trial lasted on average 15 months, until 1997, the last year for which we received referral data. The long-term effects on referral patterns are unknown. One might suppose that there is a gradual extinction of the medical educational effect. It is not known whether this supposition is correct and how many years the extinction process takes. Nevertheless, with regard to the costs, there will be a cumulative saving that is higher than that calculated above. In the years after the follow-up period there will be fewer referrals without any extra time investment from cardiologist's side. Assuming that the effect on the reduction of the referral rate decreases every year by 20% to become totally extincted after 5 years, the cost saving over 5 years would be 300% (= 100+80+60+40+20) of the amount calculated above.

When we compare the results of the joint consultation trial for cardiac patients with those of the trial carried out by Vierhout et al. for orthopaedic patients (2), it is striking that in both studies a reduction of about 10% in the practices of the participating GPs is achieved. This percentage can be used as a guideline when the joint consultation method is considered for other specialities.
It should be noted that the cardiologist will not experience the referrals prevented as a relief in daily workload in view of the constantly growing number of patients visiting the out-patient clinics (8). At most a shorter waiting list might be the result.
The extent of the savings found by Vierhout et al. is higher than in the cardiology trial. Among other reasons, this difference is caused by a different calculation method, since Vierhout used the particular fee that was offered to the orthopaedic surgeons which is lower than their real fee (9).

We conclude that the joint consultation system results in a reduction of the

referral rate to a degree that joint consultations are cost effective. These results should appeal to health care policy makers and insurance companies who are looking for methods to improve the effectiveness of health care. It might be expected that they will ensure the necessary conditions so that GPs and specialists can choose the joint consultation method for content reasons: participation in joint consultations makes the daily work much more interesting and the collaboration better.

references

1 Vlek JFM, Esch HWMJ van, Verest LFHM, Vierhout WPM, Crebolder HFJM
Cardiale problemen in de huisartspraktijk [Cardiac problems in general practice: an inventory]
Hart Bull 1997;28:55-9

2 Vierhout WPM, Knottnerus JA, Ooij A van, Crebolder HFJM, Beusmans GMHI, Pop P, Wesselingh-Megens AMK
Effectiveness of joint consultation sessions of general practitioners and orthopaedic surgeons for locomotor system disorders
Lancet 1995;346:990-4

3 Boer F den, Hageman GCHA, Waal MWM de
Het gezamenlijk consult in de eerste lijn. Een alternatief voor verwijzen naar de tweede lijn? [The joint consultation in primary care. An alternative for referral to specialist care?]
Medisch Contact 1996;51:221-3

4 Vrieze OJ, Boas GM, Janssen JHA
Een simulatiemodel voor toekomstanalyse van coronaire hartziekten. Een rapport opgesteld in opdracht van de Stuurgroep Toekomst-scenario's Gezondheidszorg [A simulation model for future analysis of coronary heart disease. A report commissioned by the Future Scenarios in Health Care Steering Group]
Utrecht, 1994

5 Rutten FFH, Ineveld BM van, Ommeren R van, Hout BA van, Huijsman R
Kosten-berekening bij Gezondheidszorgonderzoek. Richtlijnen voor de praktijk. Stuurgroep Toekomstscenario's Gezondheidszorg. [Calculation of costs in health care investigation. Directives for practice Future Scenarios in Health Care Steering Group]
Utrecht, 1993

6 Scheerder R, Vliet H van
De lumpsum en de honorering van medisch specialisten [The lump sum and remuneration system of specialists]
Medisch Contact 1999;54:244-7

7 Rutten FH, Bohnen AM, Hufman P et al.
NHG-standaard Angina Pectoris [The NHG standard for Angina Pectoris]
Huisarts Wet 1994;37:398-406

8 **Jaarverslag van de Ziekenhuizen Noord Limburg 1998 [Annual report of the Hospitals of Northern Limburg 1998]**
Venlo, 1999

9 Vierhout WPM
Het gezamenlijk consult huisarts-specialist in de eerste lijn [Joint consultation of GP and specialist in primary care]
[Proefschrift] [Thesis] Maastricht: Maastricht University, 1994

chapter 9

the joint consultation carrousel.

from experiment to regular service

Dutch version submitted as:

De Gezamenlijk Consult Carrousel. Van experiment tot voorziening

Vlek JFM, Lommen CAC, van Rey FJW, Vroomen JGH, Crebolder HFJM

abstract

objectives To study the feasibility and the effects of a system of joint consultation sessions: the joint consultation carrousel.

design Descriptive

methods A joint consultation carrousel had been carried out as part of a Care Renewal Experiment of the Hospitals Northern Limburg in which 6 different specialities participated. Small groups of GPs met with specialists in monthly consultation sessions. After one year they could change speciality. Questionnaires were completed about every patient by his GP, the specialist and the patient himself. Half a year after the joint consultation the GP completed a follow-up questionnaire. Participating GPs and specialists were asked about their experiences.

results Two groups of GPs participated in 3 cycles, 2 others in 2 cycles, 5 groups in one cycle each. More patients with orthopaedic, ear or skin problems could be selected per cycle than patients with cardiologic, urologic or pulmonary problems. Diagnostic and/or therapeutic uncertainty were the main reasons to select patients. The GPs especially gained more certainty as to their diagnostic procedures and performance. More than 90% of the patients had confidence in the joint consultation method. All GPs and specialists concluded that the joint consultation method improved their collaboration. For the GPs there was an important effect of continuing medical education. For the specialists the joint consultation meant an increase of tasks.

conclusion The joint consultation method is feasible. A regular service must be possible when the method is part of the arrangements the specialists make with the insurance companies. The efficiency will probably be improved by integrating the joint consultation method in the normal working procedures.

key words Joint consultation, carrousel, feasibility.

introduction From 1995 till 1997 a number of projects were carried out in connection with the Care Innovation Experiment of the Foundation Hospitals of Northern Limburg (sZNL), the medical staff of the sZNL, the care insurance companies VGZ and CZ, and Regional Union of GPs (Regionale Huisartsen Vereniging, RHV) (1). One of those projects concerned a joint consultation project of GPs and specialists.

The project started with joint consultations with cardiologists. The assumption was that joint consultations would be meaningful for complaints of any tract (2). This led to the joint consultation carrousel. The carrousel method involves regular joint consultation

sessions between a number of groups of GPs and consultants from various specialities such that after one year the GPs always have the opportunity to change and go on with another speciality. The application of the joint consultation method as a carrousel has not been described elsewhere as far as we know.

The present study was set up to seek answers to three questions:

- Is it possible to set up a system of joint consultation sessions with a number of groups of GPs and consultants of various specialities?
- Are the effects of a carrousel similar to the effects of research projects previously carried out concerning the joint consultation method?
- Which conditions have to be satisfied to institutionalise the carrousel method in existing care services?

methods

The carrousel started with one speciality, cardiology, and was subsequently extended to orthopaedics, otorhinolaryngology (ENT: 'ear, nose, throat'), urology, dermatology and pulmonology. Interest in participation among the GPs in the area was gauged by a short written questionnaire, while the specialists were approached directly by the divisional head.

In the carrousel basically the same working method were used as in the joint consultation project that is described in chapter 3, see box 3.1. For each speciality one cycle lasted about one year, for ENT and dermatology for different reasons only half a year.

Data on each patient discussed were obtained by questionnaires. The GP completed a questionnaire about the patient's complaint, the reason to select this patient, the diagnosis stated before the joint consultation took place and the diagnosis stated during the joint consultation, the intended treatment and the added value of the discussion about this patient for the GP. The patient completed a questionnaire about his perception of the joint consultation method. Half a year after the joint consultation, the GP was again asked to provide data about the present condition, diagnosis and treatment of the patient in question so that some follow-up could be carried out. In this article only the follow-up data of the cardiology, orthopaedics, ENT and dermatology joint consultations are presented.

Two years after the start, the project was evaluated by means of a questionnaire among the participating GPs and consultants. For both groups the questionnaire was almost identical. Finally, the specialists were consulted about problems they perceived with the joint consultation method with a view to making the joint consultation as a regular service.
For the GPs participation contributed to their accreditation.

The analysis was carried out before the end of the project, because at the time of the analysis it had been planned to evaluate the project to decide whether or not it should be continued. That is why the figures in table 9.1 on the one hand and tables 9.2 - 9.4 on the other do not seem to balance. Table 9.1 gives an idea of the total number of participants during the whole course of the project, while in the following tables not all data of cardiology, orthopaedic surgery and pulmonology can be presented because the analysis had to take place before the project was ended.

results

GPs and specialists

Of more than 100 GPs in the area 75% responded the call for participation. Fourteen GPs did not want to participate or had various reasons for their reluctance to do so, among which: intending termination of practice life, collaboration with another hospital, expectation that too much time would be involved. The willingness of the specialists to participate was good: only one partnership refused co-operation.
Table 9.1 shows for each speciality the year that the first joint consultation cycle started, and the number of participating consultants and GPs' groups. Of 17 groups planned, 9 actually participated, 2 of them in 3 cycles, 2 others in 2 cycles and the remaining 5 each in 1 cycle. The evaluation questionnaire was completed by 81% of the GPs and by 71% of the specialists as well. More than 90% of all responders were satisfied with the working method. Some specialists indicated some capacity problems because they had less time for consulting hours by contributing to joint consultation sessions.

starting year, number of participating specialists and groups of GPs, and some background data of the patients discussed: number, percentage male gender, and percentage of patients older than 60 years table 9.1.

speciality	starting year	specialists	GPs' groups	patients per cycle	gender male	age > 60
		n	n**	n	%	%
cardiology	1996	3	6	17	50	60
orthopaedic surgery	1997	3	4	33	40	24
ENT *	1997	1	1	23	56	13
urology	1997	1	1	8	100	50
dermatology*	1998	1	1	23	33	25
pulmonology	1998	2	2	11	66	66

* cycle duration was 1/2 year for ENT and dermatology

** in total 9 groups of GPs have participated

care process and referrals

The number, gender and age of the selected patients is also shown in table 9.1 while their complaints, diagnoses and reasons for selection are presented in table 9.2. In each cycle the group of selected patients included more patients with orthopaedic, ENT or dermatologic complaints than patients with cardiac, pulmonary or urologic problems. Uncertainty about diagnosis or uncertainty about treatment were the main reasons for GPs to select patients. Less frequently reported reasons were reassurance of the patient or the possibility to gain a second opinion.

table 9.2. **most incident complaints, diagnoses and reasons for selection**

(percentages)

speciality	complaints*	%	diagnosis	%	reason for selection *	%
cardiology	chest pain/angina p.	24	angina pectoris	21	diagnostic	58
(n=67)	rhythm complaints	21	(P)SVT/ES	16	therapeutic	63
	murmurs	13	heart failure	12		
orthopaedic	complaints of knee	23	knee: ligaments/menisci	13	diagnostic	59
surgery	shoulder	13	arthrosis	7	therapeutic	78
(n=75)	hip	12	shoulder syndromes	11		
ENT	hearing complaints	25	otitis media/externa	30	diagnostic	70
(n=23)	otitis	25	disorders eardrum	22	therapeutic	74
	other ear compl.	24	hearing problems	22		
urology	miction complaints	88	benign hyperplasia	50	diagnostic	100
(n=8)	haematuria	12	of the prostate		therapeutic	50
dermatology	naevi	25	psoriasis or			
(n=23)	rash	25	chronic eczema	33	diagnostic	75
	nail disorders	16	naevi	25	therapeutic	33
pulmonology	dyspnoea	83	COPD	100	diagnostic	50
(n=11)	cough	50			therapeutic	50
	test abnormalities	50				

* more than one complaint and reason for subsequent selection could be filled in
angina p. = angina pectoris; compl. = complaints

The group of selected patients had a broad variety of complaints. However, most patients selected for joint consultations with a urologist had miction complaints, while all patients selected for a pulmonology joint consultation had chronic obstructive pulmonary disease. In most cases the treatment was adjusted or changed because of the findings of the joint consultation, see table 9.3. During the pulmonology and dermatology joint consultations no patients needed referral. Of the other specialties the number varied from 24% (orthopaedic surgery) to 34% (urology). Overall, the most important benefit of the case discussions for the GPs was diagnostic certainty.

results of joint consultation sessions. the GPs' performance: diagnosis and/or treatment changed. the added value for the GP (percentages) table 9.3.

	GPs' performance *		referrals	added value *		
	diagnosis changed %	treatment changed %	referral rate %	diagnostic certainty %	therapeutic certainty %	more knowledge %
cardiology (n=67)	24	63	28	67	60	45
orthop. surgery (n=75)	46	66	24	47	49	35
ENT (n=23)	70	70	34	61	43	48
urology (n=8)	83	83	33	83	0	66
dermatology (n=23)	75	92	0	75	66	42
pulmonology (n=11)	66	83	0	50	33	50

* more than one answer could be given

In table 9.4 some follow-up data are presented. The number of cases where the diagnosis had to be changed during the follow-up period varied from 6 to 17%, and the number of patients who still had to be referred in the follow-up period showed a similar variation. The follow-up questionnaire also revealed that the GPs felt more certain in daily practice and that they had adjusted their management in the light of the joint consultation sessions.

follow-up data, provided by the GP: situation about 1/2 year after the joint consultation (row percentages) table 9.4.

speciality	diagnosis still changed %	patient still referred %	GP satisf. about joint cons %	GP more certainty %	GP changed managem. %
cardiology	6	8	92	80	43
orthopaedic surgery	15	12	87	76	40
ENT	13	13	100	82	78
dermatology	17	17	100	75	50

satisf. = satisfied; managem. = management

Almost all patients had confidence in the joint consultation method and found (in 92 to 100% of the cases) that this method should also be applied for patients with other complaints. They especially reported that sufficient attention had been paid to their problem, that they appreciated the contribution of specialist expertise, and that, in many cases, they were glad that they had not been referred to the hospital. Only a few patients reported having been troubled by so many doctors being present during the session.

collaboration

The participants were unanimous in their opinion that the joint consultation contributes to better collaboration. In that respect personal contact is a main factor leading to the enhancement of mutual respect and confidence. Besides, referral back to primary care has been facilitated, as has been stated by some specialists.

medical education

Of all GPs 88% thought that they had learned a lot by participating in the joint consultation; some emphasised further that the joint consultation is the optimal way of continuing medical education. The others were less sure about the educational effect. The specialists affirmed the medical education effects of the joint consultation.

discussion

feasibility

The joint consultation carrousel is a feasible method in which in this project there was sufficient interest. The carrousel can be well organised when a dedicated office is established to manage this task. Because of the limited running time of the project and the subsequent extension of the number of participating specialities, for 5 groups the carrousel was limited to only one cycle. For those groups the carrousel could not yet be realised in the way it was intended.

There is great 'inter-doctor variation' (3) between the consultation groups and within the groups as well as in the number of sessions held and the number of cases discussed. This is in line with the literature (3, 4). Factors like motivation

and attitude probably play an important role. Thus for some GPs it will be difficult to present a patient to a group of colleagues and to put his questions to them. The nature of the specialty too seems to be a main factor in the selection of suitable patients. Hence, the selection for the joint consultation of such 'concrete' specialities as orthopaedics, ENT and dermatology was easier than the other specialties, also because in these specialities there is a high incidence of complaints.

effects

The aims were achieved: collaboration improved, the joint consultation was seen as an important method of medical education, and the patients had much confidence in the method. Although this project had a totally different design, the results are in line with those of a research project for patients with complaints of the locomotor system which yielded a significant reduction of 10% of the referral rate in the participating practices (2). These findings are further supported by the similar research project for patients with cardiac complaints that showed also a 10% average reduction in the referral rate in the practice population of the participating GPs, see chapter 8. We hypothesise that due to the joint consultation carrousel a similar reduction will have been achieved. The specialists involved, however, did not notice the influence of this reduction in their daily work because the workload in the out-patient clinics increased due to other factors (5). Nevertheless, the joint consultation carrousel probably contributes to a better selection of patients in primary care who have to be referred to secondary care. The repeated personal contact between GPs and specialists is an important condition to improve the collaboration (6), as was the experience of the participants. The collaboration in the region will benefit as a result of a broad implementation.

The medical education effect too is an essential part of the method that was highly appreciated by the GPs. A series of joint consultation sessions about cases which are derived from daily practice is a source of continuing medical education (7) that makes GPs feel more certain and gives them a better diagnostic and therapeutic grip on the problems encountered in daily practice. This accords with the research project for cardiac problems that showed a growth of experience-based knowledge of the GPs, see chapter 5. Probably it is this effect that caused the reduction of the referral rate within the practice population.

conditions to provide the carrousel as a regular service

Though we can make no definitive statement about the extent of cost effectiveness of the carrousel, the conclusion seems to be justified that the carrousel is a method that can contribute to some reduction of the waiting list problems of the hospitals and possibly can give some relief 'at the back doors' too by developing a policy of referrals back from secondary to primary care (8). Setting up the joint consultation carrousel as a regular service seems to be appropriate policy. For that purpose some conditions will have to be fulfilled. For the specialists it is essential that their efforts are structurally incorporated in the production agreements between specialists and insurance companies. Participation in joint consultation then will be part of the normal tasks. The joint consultation carrousel must also have a proper organisational basis in the region with a view to systematic implementation and to achieving a sufficiently large scale. The effectiveness can be enlarged if the joint consultation is seen as a clinical consultation in those cases who need to be referred and for whom further investigations or specialist testing can be planned directly without the patient having to make an appointment in the out-patient clinic first. The joint consultation can also be used to make agreements about shared care for which both the GP and specialist accept responsibility to provide tailored care (9). No doubt there are other variants to increase the effectiveness of the joint consultation method.

Summing up, the joint consultation carrousel contributes to a more selective use of secondary care and to better collaboration between GPs and specialists. Structural provision as a regular service, broadly implemented, is feasible. The re-introduction of the joint consultation at patient's bedside at home (read: in primary care) is much closer than van Es asserted in his contribution to The Medical Year 1999 (10).

references

1 Stuurgroep Zorgvernieuwingsexperiment Ziekenhuizen Noord Limburg
Algemene evaluatie zorgvernieuwingsexperiment [General evaluation of the care renewal experiment]
Venlo, 1998

2 Vierhout WPM, Knottnerus JA, Ooij A van, Crebolder HFJM, Beusmans GMHI, Pop P, Wesselingh-Megens AMK
Effectiveness of joint consultation sessions of general practitioners and orthopaedic surgeons for locomotor-system disorders
Lancet 1995;346:990-4

3 Marinus AFM
Interdoktervariatie [Inter-doctor variation]
[Proefschrift] [Thesis] Amsterdam: University of Amsterdam, 1990

4 Vierhout WPM
Het gezamenlijk consult van huisarts en specialist in de eerste lijn [The joint consultation of general practitioner and specialist in primary care]
[Proefschrift] [Thesis] Maastricht: Maastricht University, 1994

5 **Ziekenhuizen Noord Limburg. Jaarverslag 1997 [The hospitals of Northern Limburg. Annual report 1997]**
Venlo, 1998

6 Peters C, Bergh JHAM van den, Scholten GRM, Vijver FLM van de
Regionale samenwerking tussen huisartsen en specialisten. Opvattingen en uitgangspunten [Regional collaboration between GPs and specialists. Opinions and starting points]
Medisch Contact 1996;51:639-41

7 Nutting PA, Franks P, Clancy CM
Referral and consultation in primary care: do we understand what we're doing?
J Fam Pract 1992;35:21-3

8 Dijk PCM van
Terugverwijzen naar de eerste lijn? [Referral back to primary care?]
Ned Tijdschr Geneeskd 1996;140:1488-9

9 Orton P
Shared Care
Lancet 1994;344:1413-5

10 Es JC van
De Nederlandse huisartsgeneeskunde in de 21e eeuw. Medisch Jaar 1999 [Dutch general practice in the 21st century. Medical Year 1999]
Utrecht, 1999

chapter 10

general discussion

introduction In this chapter the main findings of the Joint Consultation project are presented, followed by a discussion of the strengths and limitations of the trial. The implications for medical care and collaboration between GPs and specialists are also highlighted. Recommendations for further research and training are made.

main findings

The results of the trial and the several parallel projects can be summarised as follows:

The joint consultation method

- provides care that is at least according to professional standards (chapter 4)
- results in a reduction of the referral rate and improves the selection for referral (chapters 4 and 8)
- is an important method of continuing medical education (chapter 5)
- improves the collaboration between GPs and cardiologists (chapter 6)
- is appreciated by the patients who have much confidence in the method (chapter 4)
- was not optimally used mainly because of the design of the study (chapter 7)
- seems to be cost effective (chapter 8)
- is feasible as a regular working method (chapter 9)

Each of the results mentioned will be briefly commented upon. Between the intervention and control groups there were no significant differences in the outcome of care variables. So we conclude that the joint consultation care is at least as good and effective as the usual care. In the intervention groups it was noted that more patients died than in the control group. A review carried out by a cardiologist, however, made clear that none of them could be related to the joint consultation.

A major point in the assessment of the effectiveness of the joint consultation was the reduction of unnecessary referrals from GPs to cardiologists. Almost twice the number of control group patients had been referred compared to the intervention group. Some referrals in the intervention group were at first not considered by the GP as he did not fully appreciate the severity of the patient's condition. So the joint consultation contributed to the quality of the referral process.

We studied the effects on knowledge growth of participating joint consultation sessions, assuming that discussing real patients' cardiological problems with a cardiologist during about 10 sessions of 1.5 hours each is an important method of continuing education for the GPs. We assessed the GPs' knowledge in two ways, first by taking a pair of knowledge tests before and after the intervention period compared with the same tests taken in a control group of GPs. As we did not find a significant difference, it seems that the GPs

did not reveal a growth of evidence-based knowledge. The other way was an interview with a sample of the participating GPs, which made fully clear that the GPs learned a lot. Our conclusion was that the GPs learned to acquire more control of all kind of cardiac problems, learned to recognise what is serious and what is not, and how to handle the patients better. This was defined as growth of experience-based knowledge, which among other effects resulted in greater diagnostic certainty reported by the GPs.

Improving collaboration was a main motive for both GPs and cardiologists to participate. Better collaboration is not an aim in itself but a tool for improving the efficiency and effectiveness of care. In this project better collaboration was achieved by the repeated personal meetings of the joint consultation sessions, which gave both GPs and cardiologists the opportunity to learn from each other and so to gain confidence in each other. It proved to be important that the consultant-cardiologist is one of the team the GPs have to deal with in daily practice and patient care.

The patients highly appreciated the joint consultation method: they had much confidence in the conclusions of the joint consultation sessions and advice or treatment given. This, they reported, stemmed from the contribution of cardiological expertise and the possibility for their own GP to deliberate with the cardiologist. Many patients mentioned being glad that they did not have to be referred as a consequence of having participated in the joint consultation.

We found a great overlap in the features of the group of patients selected for the joint consultation project and the patients who were directly referred to the out-patient clinics. In the latter group, patient's anxiety was one of the main reasons to refer. Among this subgroup of anxious patients the cardiologists often concluded that the patients did not have a cardiac disease. So a greater substitution effect can be gained if more often patient's anxiety were recognised by the GPs as a proper reason to include the patient for the joint consultation.

A decrease of the cardiological referral rate in the participating practices was found compared to that of their regions. By using a simulation model designed for a coronary heart disease scenario (for health care policy makers), we made a conservative estimate that this reduction of the referral rate results in substantial cost effectiveness.

The joint consultation project could be integrated in a scheme that aimed at a broad implementation with other specialities. Conditions for the further implementation as a regular task and working method were formulated.

To sum up, we conclude that there are strong indications that the joint consultation is an efficient, effective and feasible method.

methodological aspects

In this thesis the results of five interrelated studies are presented on:

- the effectiveness of the joint consultation: a randomised trial
- growth of knowledge: a comparative study about knowledge testing
- objectives and experiences of participants: a descriptive study based on evaluating questionnaires
- a comparison of patients who were directly referred to the cardiological out-patient clinic and those participating in the joint consultation: a descriptive study
- a cost effectiveness study based on referral data: a descriptive study
- the feasibility of the joint consultation in non-experimental setting and a broad implementation with other specialities: a descriptive study

Below we will briefly discuss their strengths and limitations.

randomised trial

The quality of care provided by the joint consultation should be at least as good as the usual care. We did not try to define 'good care'. One might say that we used the usual care as the 'gold standard'. We did not carry out a quality assessment of diagnoses achieved by the GPs nor of the cardiologists: in that case a different approach would have been needed. The strength of this part of the study was that it was performed as a randomised trial with a design that was well adhered to by the participating GPs.

The randomisation was achieved at the patient's level after selection by his GP for the joint consultation project. So the performance of the GP in the control group could be influenced by the growth in knowledge during the joint consultation sessions. The care effect of the joint consultation compared with the control group can therefore be seen as the pure effect of the consultation session not biased by an educational effect that existed in both groups.

We concluded that there was no contamination in this respect as some might think (1); quite the contrary: theoretically, some small, non-significant differences that we found in favour of the intervention group would probably have been bigger if the outcome had been compared with the quality of care provided

by GPs not participating in joint consultation.
The trial could not be blinded because the intervention could not be blinded either to the patient or to the GP. That led us to the use of an alternative design, the pre-randomisation (2), which was previously used in a similar study (3). Another problem was that maybe the intervention itself was not sufficiently standardised (1). In spite of the instructions, there might have been some differences in the way the different groups carried out the sessions, which we accepted because this is in line with the variability of daily clinical practice (2,4). The risk too that the patient might be randomised to the control group sometimes prevented the GP from selecting. In those cases the patients often were referred directly to the out-patient clinic. Other factors could also have prevented a maximum and proper selection of patients. The inclusion rate was small as was found in other studies (5).
Nevertheless we think that the internal validity was sufficient. As to the external validity, we conclude that the joint consultation has wide applicability. The fact that the methods to study the joint consultation as a clinical intervention in our project hampered the proper application of the intervention itself suggests that in daily practice the application would be better.

knowledge testing

Since we considered the joint consultation method to be an educational intervention, we studied the outcome in two ways: we used a knowledge-test derived from the National Knowledge Test that seemed to be sufficiently validated for our purposes in the studies of Pollemans (6) and van Leeuwen (7). Nevertheless, compared with the results of a control group of GPs the intervention group did not show a growth of knowledge. To explain this unexpected result, one might pose three questions:

- Did we use the proper testing method?
- Did we evaluate at the right level?
- Was there indeed no growth? According to Kirkpatrick's hierarchy of levels of evaluation, our knowledge test concerned the second level: evaluation of learning (knowledge of skills acquired). However, it became clear by means of the semi-structured, in-depth interviews that growth was indeed achieved on a higher, more complex level: transfer of learning to performance in daily practice (8). So regarding the quantitative method of testing the test chosen and the level of evaluation did not fit. Using a qualitative method we gained more insight into the kind of educational effects of the joint consultation method (9).

objectives and experiences

The study-design of the trial hampered the optimal use of the joint consultation method in patient care and collaboration. This will have had a negative effect on the results of the evaluation. We do not know exactly to what extent, because in the evaluating questionnaire this effect has been insufficiently taken into acount.

The questionnaires were sent to all GPs and cardiologists who started the project. Some of the responders will be part of the group that dropped out. This too will have had a negative effect on the results. Of the cardiologists 70% responded; we do not know the non-responders because the questionnaire was anonymous. The responding cardiologists might have had a more positive attitude. These aspects should be taken into account when interpreting the results. GPs and cardiologists had quite a different opinion about the effects of the joint consultation on regional collaboration. This might be because the question posed was insufficiently specific.

study of referred patients

The strengths and limitations of this study both concern its retrospective nature: by studying the data of referred patients retrospectively we did not interfere with the GP's decision-making process (to refer). On the other hand the GPs had to reflect in retrospect on their performance and on their referral decision, which might have influenced their opinion. So, in reality the percentage patients who could have been selected for the joint consultation might have been higher.

The study was carried out in the two largest of the five districts in the project. As almost 70% of the GPs participated in this part, we concluded that the results were sufficiently representative. However, we had to deal with the exclusion of more than 40% of the referred patients, among whom patients who did not give permission to collect their data. This might have caused a selection bias.

cost effectiveness

It was beyond the limits of the project to carry out a complete, separate study on the cost effectiveness of the joint consultation. Nevertheless we were able to make a reliable assessment by making an analysis using a simulation model with respect to coronary heart disease (10). The model is restricted to coronary heart disease, while in the joint consultation project all kinds of cardiac

problems were included. Moreover, we did not calculate the real costs but used a model based on real costs. One of the major problems in calculating the effects is how to calculate them: in our health care system we scarcely consider real costs, but mostly costs related to the budget. To calculate the costs of joint consultations sessions, Vierhout took into account the allowance the orthopaedic surgeons and GPs received for their participation in the project (11). Because we doubted that these were realistic costs, we choose a different option. In spite of the limitations and differences mentioned, we were able to draw reliable conclusions.

the Joint Consultation Carrousel

The Joint Consultation Carrousel was an implementation project based on the results of joint consultation projects that had been carried out previously (3, this thesis: chapter 4). The Carrousel was part of a major innovative scheme in the health care delivery in one specific region. The limited duration of the project and the necessity to evaluate before the actual end of the project entailed that the carrousel could not be realised for half of the groups as was intended. Nevertheless, our conclusion that the carrousel is a feasible method is based on the results of the groups that had joint consultations with several specialities and on the fact that we had succeeded to introduce subsequently 6 specialities. The limited course could not be due to the carrousel itself, but was circumstantial as explained.

We used descriptive methods. To collect reliable referral data in the practices of the participating GPs, as was done in the joint consultation trials, was beyond the design of this project, which was not a research project.

relevance and implications of the results

As we outlined in the introduction section of this thesis, the referral process is very complicated and many factors are involved. Much attention is paid to the referral process, because it has become clear that a great number (generally about 30%) of the referrals are unnecessary or inappropriate. In this regard, a high level of inappropriate referrals is not necessarily related to a high referral rate (12,13).

Some multistage models have been presented for evaluating the appropriateness of referrals that are too complicated to implement in medical practice (14,15).

The joint consultation method as studied in our project seems to provide at least a part of a solution for the complex problem of the inappropriateness of the referral process. A net reduction of the referral rate by at least 10% was achieved by the participating general practitioners, see chapter 8. This was achieved as a result of three mechanisms that influenced each other: the direct effect of consulting strategies in general practice, an educational effect, and the improvement of the collaboration between GPs and specialists.

We found that the referral of many patients who were invited for a joint consultation could be prevented notwithstanding the small number that had to be referred where the GP did not plan to do so. This finding confirms other studies (3, 16). Others too state that probably a great number of the referrals to specialist care could be avoided if 'hospital physicians had been working on a consultant basis at the health centres' (17).

In chapter 7 we described patients' anxiety as an important reason for GPs participating the joint consultation project to refer patients directly to specialist care. The joint consultation method was highly appreciated by the patients and many patients were reassured by the joint consultation. This might be due to the patient-centred style of consultation (18). So, much more advantage of this effect can be expected, possibly resulting in an even greater substitution effect.

The emphasis we put on the educational effect of the joint consultation method (see chapter 5), is supported by the comments by other authors, who have contended that education must be tailored to the learning needs of the GP, that it should help implement change in practice, that it should recognize the value of professional 'discourse', and that it has to embody principles of adult learning (19, 20). The joint consultation method reflects clearly the models for effective continuing education as summarised by Smith et al. (21). In fact, the final aim of the joint consultation should be an improvement of the GPs' competence and performance in handling cardiological problems in daily practice (22). In literature there is circumstantial evidence that the joint consultation as a practice-based intervention is an effective way of education to achieve the desired improvement (23). Education providers have suggested that multifaceted strategies need developing, and that education should not be a stand-alone activity (24). In medical education, emphasis should be put on problem-solving skills (25). The joint consultation method responds to these

demands because it offers 'a combination of information transfer and learning through social support or management support' (26).
The third pillar under the joint consultation, the collaboration between GP and specialist, was a main motive for both to participate in the project (see chapter 6). Poor communication between those two may induce referrals (27). The importance of good, even enhanced communication as central point of collaboration is emphasised by others too (28). The joint consultation has improved the collaboration in the experience of most GPs and cardiologists.
It is important to realise that this improvement of collaboration will not be achieved by organising specialist outreach clinics in general practice, because they do not seem to increase the interaction between GPs and specialists (29). Knowing each other personally is an important factor in this endeavour towards better collaboration (30). Maybe this is even one of the most important features of the joint consultation method.
We think that the joint consultation method fits sufficiently with Rogers's conditions for a proper implementation of innovations in health care (31).

recommendations for medical practice, medical education and the health care system

The joint consultation system should be set up structurally. It seems to be important to pay more attention to the specialist's view and benefits he can gain.
As the assumption of the evidence-based medicine paradigm may be shared by many general practitioners, the promotion of effective care in general practice requires a more pragmatic approach that is compatible with the complex nature of their work. This was the conclusion drawn by Tomlin et al. in a study to explore the GPs' perception of effective health care (32). As it is expected that a greater proportion of care will be provided outside hospitals, better collaboration and communication between primary and secondary care will be needed to optimise the effectiveness of this new shared care model (33).

The principles of good outpatient care are, among others:

- clinical responsibility for the GP while the patient remáins in the community
- specialist – GP equality
- consultation by the consultant (33).

Joint consultation is a pragmatic approach that fits very well in the concept of shared care leading to a better selection of patients who need specialist care. The joint consultation projects for orthopaedic and for cardiological patients both resulted in a reduction of the referral rate by about 10%, which is about one third of the assessed number of inappropriate referrals. It can be expected that this effect would contribute to shortening the waiting time for specialist care. Also the joint consultation can contribute to a more efficient patient flow at the 'back door' of the hospital. Many patients are too long under specialist control in the opinion of GPs and specialists alike (34). Joint consultation sessions give specialists and GPs an opportunity to discuss the terms under which the specialist can hand over further care of their patients to the primary care sector (35).

The joint consultation should be taken up structurally in the schedule of the continuing medical education because of the growth of experience-based knowledge of the GPs. Participation in joint consultation sessions should be structurally incorporated in the system of accreditation of medical education. In literature the need for continuing professional development is emphasised, medical education being part of that development (36). The joint consultation seems to fit well with this need, especially in respect of the skills that will be improved by participating in joint consultations.

Health care policy makers and health care insurance companies should create the basic terms to implement the joint consultation structurally. It is especially important to make production agreements in the contracts between specialists and insurance companies. Furthermore it is advised to establish a permanent joint consultation office in every region in which the system is going to be implemented. The main task will be a proper implementation and regular evaluation.

It is known that the structural implementation of many (up to 50%) 'innovative care' projects did not succeed because financing ceased (37). The same study found that establishing a coordination point or office is important to aid the implementation. The joint consultation method should be more integrated in the usual diagnostic procedures: when during a consultation session it is decided that a patient should undergo further specialist diagnostic testing, this test should be

arranged directly without the referral of the patient to the out-patient clinic. The agenda of the joint consultation should be decided both by the GPs and specialists with special attention for the use of the joint consultation to discuss and possibly implement 'transmural' protocols. Themes that are often discussed in joint consultation sessions should be taken up in the regional medical education programmes in order to improve the impact of the method.

recommendations for further research and training

It is necessary to find evidence for medical education methods (38): the joint consultation as a method of medical education should be more specifically studied and compared with others. There are indications that the joint consultation method is effective and interesting, maybe more so than other methods. The outcome might lead to choices in medical education programmes.

Furthermore, it is important to learn more about the differences between evidence-based knowledge and experience-based knowledge. In respect to the latter, what exactly is experience-based knowledge and why exactly can the joint consultation make it grow?

More research should be done to find out whether the joint consultation is a cost-effective method. An answer to this question might be important for health care politics and care insurance companies that should create the structural and financial conditions for GPs and specialists to participate in joint consultations.

We suggested several variations in the application of the joint consultation method to improve further the effectiveness and benefit for the specialist: especially the effects of referring back from secondary to primary care by way of the joint consultation should be studied (39). Similarly, it is valuable to investigate the consequences of the findings of the joint consultation project for teaching methods for medical students. For instance, more attention could be directed to the diagnostic decision making process of how to get from a complaint to a diagnosis, as there is so much diagnostic uncertainty.

references

1 Horst HE van der
Onderzoek naar de effectiviteit van een complexe interventie in de huisartspraktijk. Problemen bij opzet en uitvoering [Problems in the design of a clinical trial carried out in general practice]
Huisarts Wet 1999;42:5-10

2 Knottnerus JA, Dinant GJ
Medicine-based evidence, a prerequisite for evidence-based medicine
BMJ 1997;515:1109-110

3 Vierhout WPM, Knottnerus JA, Ooij A van, Crebolder HFJM, Beusmans GHMI, Pop P, Wesselingh-Megens AMK
Effectiveness of joint consultation sessions of general practitioners and orthopaedic surgeons for locomotor system disorders
Lancet 1995;346:990-4

4 Weel C van. Knottnerus JA
Evidence-based intervention and comprehensive treatment
Lancet 1999;353:916-8

5 Peto V, Coulier A, Bond A
Factors affecting general practitioners' recruitment of patients into a prospective study
Fam Pract 1993;10:207-11

6 Pollemans M
Kennistoetsing bij huisartsen [Testing of knowledge of general practitioners]
[Proefschrift] [Thesis] Maastricht: Maastricht University, 1994

7 Leeuwen Y van
Growth in knowledge of trainees in general practice. Figures on facts
[Thesis] Maastricht: Maastricht University, 1995

8 Kirkpatrick DI
Evaluation of training
In: Craig R, Bittel I, eds. Training and development handbook
New York: McGraw-Hill,1967

9 Pope C, Mays N
Reaching the parts other methods cannot reach: an introduction to qualitative methods in health and health services research
BMJ 1995;311;42-5

10 Vrieze OJ, Boas GM, Janssen JHA
Een simulatiemodel voor toekomstanalyse van coronaire hartziekten [A simulation model for prospective analysis of coronary heart disease]
Rijswijk: Stuurgroep Toekomstscenario's Gezondheidszorg, 1994

11 Vierhout WPM
Het gezamenlijk consult van huisarts en specialist in de eerste lijn [The joint consultation of general practitioner and specialist in primary care]
[Proefschrift] [Thesis] Maastricht: Maastricht University, 1994

12 Reynolds GA, Chitnis JG, Roland MO
General practitioner outpatient referrals: do good doctors refer more patients to the hospital?
BMJ 1991;302: 1250-2

13 Knottnerus JA, Joosten J, Daams J
Comparing the quality of referrals of general practitioners with high and average referral rates: an independent panel review
Br J Gen Pract 1990;40:178-81

14 Emmanuel J, Walter N
Referrals from general practice to hospital outpatient departments: a strategy for improvement
BMJ 1989; 299:777-4

15 Coulter A, Noone A, Goldacre M
General practitioners' referrals to specialist outpatient clinics
BMJ 1989;299:304-6

16 Boer F den, Hageman GCHA, Waal MWM de
Het gezamenlijk consult in de eerste lijn. Een alternatief voor verwijzen naar de tweede lijn? [The joint consultation in primary care. An alternative for referral to specialist care?]
Medisch Contact 1996;51:221-3

17 Lindström K, Hagman A, Berg L, Bengtsson C
Referral notes used as a tool for evaluating the co-operation between general practitioners and hospital physicians
Scand J Prim Health Care 1994;12:214-8

18 Greenhow D, Howitt AJ, Kinnersley P
Patient satisfaction with referral to hospital: relationship to expectations, involvement, and information-giving in the consultation
Br J Gen Pract 1998;48:911-2

19 Campion-Smith C, Smith H, White P, Baker E, Baker R, Holloway I
Learners' experience of continuing medical events: a qualitative study of GP principals in Dorset
Br J Gen Pract 1998;46:1590-3

20 Cantillon P, Jones R
Does continuing medical education in general practice make a difference?
BMJ 1999;318:1276-9

21 Smith F, Singleton A, Hilton S
General practitioners' continuing education: a review of policies, strategies and effectiveness, and their implications for the future
Br J Gen Pract 1998;48:1689-95

22 Southgate L
James Mackenzie Lecture 1993. Freedom and discipline: clinical practice and the assessment of clinical competence
Br J Gen Pract 1994;44:87-92

23 Davis DA, Thomson MA, Oxman AD, Haynes RB
Changing physician performance
JAMA 1995;274;700-5

24 Allery LA, Owen PA, Robling MR
Why general practitioners and consultants change their clinical practice: a critical incident study
BMJ 1997;314:870-4

25 Chantler C
The role and education of doctors in the delivery of health care
Lancet 1999;353:1178-81

26 Wensing M, Weijden T van der, Grol R
Implementing guidelines and innovations in general practice: which interventions are effective?
Br J Gen Pract 1998;48:991-7

27 Elwyn GJ, Stott NCH
Avoidable referrals? Analysis of 170 consecutive referrals to secondary care
BMJ 1994;309:576-8

28 Nutting PA, Franks P, Clancy C
Referral and consultation in primary care: do we understand what we're doing?
J Fam Pract 1992;35:21-3

29 Bailey JJ, Black ME, Wilkin D
Specialist outreach clinics in general practice
BMJ 1994;308:1083-6

30 Peters C, Bergh JHAM van den, Scholten GRM, Vijver FJM
Regionale samenwerking tussen huisartsen en specialisten. Opvattingen en uitgangspunten [Regional collaboration between GPs and specialists. Opinions and premises]
Medisch Contact 1996;51:639-41

31 Rogers EM
Diffusion of innovations: an overview
New York: The Free Press, 1995

32 **Tomlin Z, Humphrey C, Rogers S**
General practitioners' perceptions of effective health care
BMJ 1999;318:1532-5

33 Orton P
Primary care tomorrow. Shared care
Lancet 1994;344:1413-5

34 Peters PSHM, Wijkel D
Patiënten vaak te lang onder speciliastische controle. De opinie van de huisarts onderzocht [Patients often too long under specialist control. The GP's opinion investigated]
Medisch Contact 1998;53:1610-2

35 Dijk PCM van
Terugverwijzen naar de eerste lijn? [Referrals from secondary care back to primary care?]
Ned Tijdschr Geneeskd 1996;140:1488-9

36 Boulay C du
From CME to CPD: getting better at getting better?
BMJ 2000;320:393-4

37 Wiefferink CH, Dukkers van Emen DM
Institutionalisering van zorgvernieuwingsprojecten. Hoe vergaat het zorgvernieuwingen op de lange termijn? [Instituting care innovation projects. How does care innovation turn out in the long term?]
Medisch Contact 1996;51:644-6

38 Hutchinson L
Evaluating and researching the effectiveness of educational interventions
BMJ 1999;318:1267-9

39 **Gezamenlijk Consult huisarts-reumatoloog in de huisartspraktijk. Projectaanvraag ZorgOnderzoek Nederland (ZON) [Joint Consultation between GP and reumatologist in general practice. Project-proposal Health Research and Development Council]**
Maastricht: T&DC, Academic Hospital Maastricht; 1997

chapter 11

summary

This thesis deals with joint consultations of general practitioners and cardiologists in a primary care setting. A joint consultation is a meeting of a small group of 3 or 4 general practitioners (GPs) with a specialist-consultant, during which they discuss the complaints and treatment of patients who are invited by their GPs to participate. During the session the patient can be examined. The aims of joint consultations are: providing good clinical care to the patient, reducing the number of unnecessary referrals to the secondary care, improving the collaboration between GPs and specialists, and improving the expertise of the participating GPs. Since was clear that joint consultations were beneficial for patients with orthopaedic problems we were curious to know whether they were as beneficial for patients with cardiac problems. To study this question a research project was set up.

Chapter 1 provides a detailed introduction to the reasons for this project. It deals with the problems the GP meets in daily practice as gatekeeper in the Dutch health care system. One of these problems is diagnostic uncertainty that seems to be an important variable in the GP's decision making process. Giving the GP more test facilities as studied by some investigators does not seem the final solution because many patients will be tested unnecessarily. Of the patients who are referred to secondary care, more than 40% will be referred for diagnostic reasons. Many, up to 30% and even more, referrals are judged to be unnecessary. Part of these could have been prevented if a better diagnostic process had been achieved. It is remarkable that the referral process does not influence the specialist care and the referral's outcome. So to be a good gatekeeper the GP should pay much attention to the selection and decision making process to be sure that the right patient will be referred. GPs and specialists have a great ignorance of each other's working methods, which is one of the causes of the great number of repeated referrals in cardiology. Substitution of care can only be achieved if the complementary character of these working methods can be better attuned.
The problems outlined so far led to the research project 'The joint consultation of general practitioner and cardiologist in a primary care setting'.
The aims of this project were as follows: to reduce GP's diagnostic uncertainty, to improve the selection for referral, to improve the collaboration between GPs and cardiologists.
The following research questions were studied:

- What is the kind and quantity of the cardiac problems the GP has to deal with

in daily practice and to what extent does diagnostic uncertainty influence the GP's performance?

- What is the effectiveness of joint consultation sessions of GPs and cardiologists in general practice on the care for the patient and his state of health, and how are they appreciated by the patients?
- Does participation in joint consultation sessions lead to growth of GP's knowledge?
- What objectives do GPs and cardiologists have to participate in joint consultation sessions in general practice, have they been achieved and what are the experiences of the GPs and cardiologists?
- To what extent do the patients with non-acute cardiac complaints who are referred directly to the outpatient clinic differ from the patients who are selected for the joint consultation, and has there been an optimal use of the joint consultation?
- Does participation in joint consultation sessions achieve a reduction of the number of cardiac referrals, and does this lead to a reduction of costs?
- Is the joint consultation of GP and specialist in general practice a feasible method?

In **chapter 2**, titled 'Diagnostic uncertainty as to cardiac problems in primary care. Information from general practice data bases', the diagnostic uncertainty in general practice is underlined. Of all reasons for encounter (RFE) the GP meets, about 12% concern the circulatory tract. Of these, less than 25% lead to a cardiac disorder or disease, while in a further quarter to one third of the cases the diagnosis remains uncertain. The incidence of cardiac diseases is rather low, while the prevalence is rather high: about 12 to 20% of all episodes. Of these, 25% concern hypertension, with ischaemic heart disease, heart failure and atrial fibrillation being the three next most prevalent. Depending of the diagnosis, 10% to 28% of the patients are referred. The percentage of cardiac patients who are referred unnecessarily is unknown: in any case the referral rate is influenced by diagnostic uncertainty.
It can be concluded that cardiac problems form an important part of the morbidity presented daily to the GP. The future rise in the prevalence of the main chronic cardiac diseases and their unfavourable prognosis require the GP to devote much attention to the management of these disorders. New models of collaboration between GPs and specialists, like the joint consultation, can contribute to an improvement of the GPs' skills and expertise.

The research questions, design and methods of the randomised trial with the joint consultation as intervention are described in **chapter 3**. Its effects were compared with those of usual care provided to a control group of patients. In five regions in the south-east of the Netherlands GPs and cardiologists were invited to participate in the project. Patients could be included when their GP was uncertain about diagnosis or treatment, or when the patients were uncertain or anxious about their complaints. Patients who were considered suitable for a joint consultation by their GP were randomly assigned to either the intervention or the control group. A pre-randomisation design was used in which the patients got only the information about the arm they were assigned to, so after randomisation took place. The pre-randomisation design for the evaluation of joint consultations has been approved by the Medical Ethical Committee of the Academic Hospital Maastricht. A survey of the dependent and independent variables is given, as well of the used questionnaires for patients, GPs and cardiologists. The intervention period took 1.5 years on average, during which joint consultation sessions were regularly held by each group. All patients, in both groups, were subjected to a joint consultation of their GP with a cardiologist after a follow-up period.
Seventeen groups with a total 56 GPs started the project of whom 7 dropped out. So 49 GPs in 16 groups completed the study while 13 cardiologists were involved. Most of the GPs were experienced: 75% were 40 years or older, while two-thirds of them had been working longer than 10 years in general practice. One third of the GPs were established in a primary health care centre. This is more than the figures nationally which show only 10% working in such centres.

The results and conclusions of the trial are presented in **chapter 4** titled 'Effectiveness of joint consultation sessions of general practitioners and cardiologists in a primary care setting'. Patient effect variables were: the general state of health, the degree of well being, patterns of complaints after follow-up, the severity of the patient's condition as assessed by the cardiologist, the patient's worrying about his complaint. Care effect variables were: the number of diagnostic actions by the GP, the number of referrals to cardiologists, and changes of diagnosis in the period between initial and follow-up consultation. The GPs included 396 patients of whom 306 remained for analysis: 148 in the intervention and 158 in the control group The withdrawal percentage was 23%. In the intervention group more patients died than in control group but there was

no indication that any of these cases was related to a delay or a lack of care resulting from the joint consultation.
Patients' age, gender and clinical variables were similarly distributed in both groups, as were the GPs' reasons to select the patients. Of these, diagnostic uncertainty prevailed over therapeutic uncertainty. Of all complaints, chest pain was the main category presented in 24% of the cases. In the intervention group, 56% of the GPs' diagnoses were agreed during the consultation, the percentages for the specific diagnoses ranging from 33% of the heart failure cases to 80% of the angina pectoris cases. In the intervention group, less diagnostic testing (i.e. electrocardiography and x-ray) was carried out. The intervention group patients considered their complaint to be dealt with satisfactorily or appropriately significantly more often than the control group patients.
Significantly more patients in the control group were referred, 52% versus 33%, including in the follow-up period during which in the control group the diagnosis had to be changed more often. There were no other significant differences between the two groups after the follow-up period.
The referral rates in the practices of the participating GPs showed a decrease of 10% compared with the referral rate in the whole region, which is a significant difference.
The conclusion is that the joint consultation of GPs and cardiologists provides a quality of care that is equal to usual care for patients with cardiac complaints and disorders despite a decrease of the number of investigations and referrals. Joint consultations contribute to the selection of those patients who need indeed specialist investigation. The results of joint consultation showed a similar pattern for patients with orthopaedic and those with cardiac complaints. Its effect may further be improved by giving access to specialist testing for those patients who otherwise would have been referred as a result of the joint consultation.
The joint consultation is an efficient method to achieve more effective care for primary care patients with cardiac symptoms. Further studies in other speciality domains are therefore recommended.

Chapter 5, entitled 'Joint consultation as a method for continuing medical education and professional development', reports a study on the medical educational effect of the joint consultation.
Participation in joint consultation was considered to have an educational effect on the GP's competence and performance. It should enable GPs to provide

better care also to patients who were not discussed during the sessions. The joint consultation method is likely to meet all requirements for a successful promotion of the GPs' expertise as it is small-scale and close to home, addresses daily issues and allows GPs to test their own methods of working and acquire new skills in a small group of colleagues. The research question was to determine whether participation in joint consultation sessions about cardiology patients increases the GP's competence.
We assessed the effects in two different ways. For the quantitative assessment we used a knowledge test consisting of 50 items focussing specifically on cardiology selected from the National Knowledge Test for General Practitioners (NKT), because this test was found to have predictive value for the GPs' performance in daily practice. The test consisted of statements about cases occurring in general practice. The test was administered to the GPs twice: before and after the intervention period. Their results were compared with those of a control group of GPs who also did the test twice.
The other assessment consisted of a qualitative method, a semi-structured interview with a sample of the participating GPs about their perceived increase of knowledge, the changes in medical performance and the experienced relevance. The sample was divided in three groups of GPs depending on the number of patients each had included for joint consultation sessions.
On average there were no important differences between the results of the quantitative tests before and after intervention in any region, which applies to both the intervention and the control groups. In the interviews the GPs mentioned a self-perceived increase of knowledge, most of them reported they felt more confident about their performance with respect to cardiac complaints, regarded joint consultation useful for daily practice and appreciated the final learning effect. The quantitative test, focussing on evidence-based knowledge, did not seem to be appropriate to measure the type of knowledge acquired by the joint consultation, that can be termed as experience-based knowledge. We conclude that joint consultation indeed is helpful to improve the GP's competence and can be a meaningful instrument to professional development.

The experiences of the GPs and cardiologists participating in the study are dealt with in **chapter 6**, 'Joint consultation sessions of GPs and cardiologists. Objectives and experiences'. Whether the joint consultation can be offered as a regular service in future collaboration patterns between GPs and cardiologists depends on the experiences of these two groups. So it was important to know

with which objectives the GPs and cardiologists started the project and how they have experienced their participation. Their opinion was also sought about the joint consultation working method. To answer these questions the GPs and cardiologists were asked to complete a questionnaire after the last follow-up joint consultation.

The questionnaire was completed by 51 of the 56 initially participating GPs and by 9 of the 13 cardiologists. Most GPs indicated several objectives. The most important was medical education, indicated by 96% of the GPs, which in 85% was more or less achieved. A second objective was to reduce diagnostic uncertainty, indicated by 82% of the GPs, which was achieved more or less in 87%.

Other objectives were 'improving treatment possibilities' by 76%, achieved in 71%; 'improving collaboration' by 76%, achieved in 69%; 'reassuring the patient' only by 63%, achieved in 88%; and 'reducing referrals' by 49%, achieved in 56%.

For the cardiologists, 'improving collaboration' was the main motive, indicated and achieved by all of them. Other important objectives were 'medical education of the GP' indicated by 89% and achieved by all of these; 'reducing diagnostic uncertainty' by 89% achieved by 87% of these; 'reassuring the patient' by 89% and 88% respectively; and 'reducing referrals' by 66% and 66% respectively.

All 148 joint consultation cases gave their GP some added value, mostly more diagnostic and therapeutic certainty. The direct personal meeting of the GPs and cardiologists was appreciated by almost all GPs and all cardiologists.

Of the GPs, 84% mentioned that sometimes there were too few patients suitable for inclusion, and 85% found that the randomisation was at least once an obstacle to inviting a patient.

Most of the GPs and cardiologists gave a positive overall appreciation and would like to continue their participation in joint consultations. We must remark that the responding cardiologists might have had a more positive opinion than their non-responding colleagues.

It can be concluded that the main objectives like medical education and improving GPs' diagnostic certainty are achieved more or less by the GPs and cardiologists as well. Although the direct personal contact was appreciated positively, the GPs judged that the regional collaboration between GPs and cardiologist did not improve. This can partly be explained by the fact that in some regions the consultant was not practising in the same region. This

suggests that joint consultation should only be held with consultants working in the same region as the GPs.
The study design was found to be a big barrier, leading to a sub-optimal use of the joint consultation method and possibilities. Nevertheless it is recommended to implement the joint consultation system broadly and not to cease carrying out this type of survey to achieve evidence-based care innovation.

During the project a number of patients were of course referred directly to the outpatient clinic instead of being selected for the joint consultation. We were curious to know whether there were differences between this referred population and the joint consultation population. A separate study was carried out of which the results are discussed in **chapter 7**, entitled 'Patients referred to the cardiologist versus patients selected for joint consultation: are there differences?' This study was done retrospectively in the two main regions of the trial where 11 joint consultations groups (69% of all groups) were participating. The patients who had been referred for the first time were traced at the outpatient clinics of the hospital. After obtaining written consent of each patient, his GP was asked to complete a questionnaire and the cardiologist's file was studied. The data gathered about the patient's complaint, cardiologist's diagnosis, reason for referral instead of inclusion for joint consultation were compared with those of the trial.
Of 226 patients traced, we could analyse the data of 129 patients. The referred group included more men and somewhat older patients. The majority of complaints were similar in both groups: in the referred group some are judged to be more serious. For 36% of the referred patients, no heart disease was diagnosed. Of all referred patients with chest pain, 56% had no cardiac disease according to the cardiologists.
In both groups diagnostic uncertainty was the main motive to refer or include respectively. In the referred group the percentage of patients referred because of patient's anxiety or for defensive reasons is high compared to that of the joint consultation group. However, in 23% of the referred cases the GPs admitted in retrospect that the patient could have been included for joint consultation. In one third of these cases avoidance of the randomisation was the reason to refer. Although the joint consultation method is a very appropriate way of working to reassure patients, patients' anxiety was more often a reason to refer. This probably can partly be due to the randomisation procedure.
We conclude that the GPs have not made optimal use of the consultation and

that more patients might have been included. A greater reduction of unnecessary referrals seems feasible when there is no randomisation procedure, resulting in a greater substitution effect.

In **chapter 8** a separate study is reported that investigated whether the referral rates of participating GPs could be reduced and whether cost saving could be achieved. Of all participating GPs except 4 and of their colleagues in the same areas data were obtained from the two main health insurance companies on the cardiac and total referral rates. The percentage of the cardiac referrals on the total number was calculated per year for both the intervention group and the GPs in the areas, and the proportional differences between 1994 and 1997 were calculated. For the costs assessment 'A simulation model for future analysis of coronary heart disease (CHD)' was used because it was beyond the possibilities to carry out a real cost effectiveness study. We limited the cost assessment to those of CHD because chest pain and CHD were the main complaint and diagnosis categories in the trial.
The proportional differences between intervention group and the respective areas are significant. An average reduction of about 10% of the patients referred yearly was achieved. A consultation group of 3 GPs will be able to prevent referral in about 40 patients. Should all these be CHD patients, a cost saving of about 14,000 guilders could be realised. The investment of a consultant for one joint consultation group per year can be assessed as 0.0125 ftp. The fee is about 6500 guilders per year. This amount has to be subtracted from the above-mentioned saving, so the net cost saving will be 7500 guilders per joint consultation group of 3 GPs per year.
Some methodological remarks can be posed because the cost saving assessment is based on a model that is restricted to CHD. Nevertheless for other cardiac disorders a similar figure can be outlined. One might suppose that there is a gradual extinction of the medical education effect of the joint consultation due to which during some years after the last joint consultation referrals will still be prevented. With regard to the costs there will be a cumulative saving that is higher than that calculated above without any extra time investment.
It is striking that the trial of joint consultation for orthopaedic patients showed a similar (=10%) reduction of referrals. We conclude that the joint consultation system results in a reduction of the referral rate to a degree that joint consultations are cost effective.

Chapter 9 reports on an implementation project of joint consultations organised as a carrousel to study the feasibility and effects of a system of joint consultation sessions. This 'Joint Consultation Carrousel' was part of a Care Innovation Experiment of the Hospitals in North Limburg in which 6 specialities participated: cardiology, orthopaedic surgery, otorhinolaryngology (ENT), urology, dermatology and pulmonology. The carrousel consisted of 9 GP groups each having joint consultation with one speciality during one year with the possibility to change speciality after one year. Unfortunately the carrousel could not be realised yet for 5 groups because of the limited running time of the project and the subsequent extension of the number of participating specialities. Questionnaires were completed about every patient by both his GP and the patient himself. Half a year after the joint consultation took place the GP completed a follow-up questionnaire, which asked the participating GPs and specialists about their experiences.

The patients with orthopaedic, ENT or skin problems seemed to be more easily selected than those with cardiac, urologic or pulmonary problems. In total more than 200 patients participated. Uncertainty about the diagnosis or therapy were the main reasons to select patients. In about a quarter of the cases a referral could be prevented. In the follow-up period in 6 to 17% of the cases the diagnosis had to be changed; a similar percentage had still to be referred. The most important gain for the GPs was more diagnostic certainty: they stated feeling more certain in daily practice. Almost all patients had confidence in the joint consultation method.

The participants are unanimous in their opinion that the joint consultation contributes to a better collaboration. All specialists and 88% of the GPs confirmed the medical education effects of the joint consultation. For some specialists contributing to joint consultations caused capacity problems at the out-patient clinic.

It can be concluded that the joint consultation is a feasible method with similar results as the trials for patients with locomotor disorders and cardiac problems respectively. To set up the joint consultation carrousel as a regular service seems to be a proper policy. For the specialists then it is essential that their efforts are taken up structurally in their production agreements with the insurance companies. The effectiveness of the joint consultation can be improved in several ways that are discussed.

A general discussion of the main results and methodological aspects is presented in **chapter 10.** The relevance of the findings is discussed and recommendations for medical practice and education as well as for further research are made.

The joint consultation system should be set up structurally in which more attention should be paid to the specialist's view. Joint consultation fits very well in the concept of shared care leading to a better selection of patients who need specialist care. Moreover joint consultation sessions can be used to discuss the terms under which further care of the patient can handed over from secondary to primary care. The joint consultation should be taken up structurally in the schedule of the continuing medical education, and participation should be structurally incorporated in the system of accreditation of medical education. For a structural implementation it is advised to establish a permanent joint consultation office.

The joint consultation method should be more integrated in the usual diagnostic procedures.

Themes that are often discussed in joint consultation sessions should be taken up in the regional medical education programmes in order to improve the impact of the method.

The joint consultation as a method of medical education should be more specifically studied.

It is important to study the differences between evidence based knowledge and experience based knowledge. What exactly is experience based knowledge, and why can the joint consultation make it grow? More research should be done to find out whether the joint consultation is a cost-effective method.

As there is so much diagnostic uncertainty more attention should be directed to the diagnostic decision making process.

chapter 12

samenvatting

Dit proefschrift handelt over gezamenlijke consulten van huisartsen en cardiologen in de eerste lijn. Een gezamenlijk consult (GC) is een bespreking van een groepje van 3 tot 5 huisartsen met een specialist van de klachten en behandeling van patiënten die door de huisartsen zijn uitgenodigd deel te nemen. De patiënten kunnen tijdens de sessie worden onderzocht. De doelen van GC-en zijn: het bieden van goede patiënten zorg, een reductie van het aantal onnodige verwijzingen naar de tweede lijn, het verbeteren van de samenwerking tussen huisartsen en specialisten en het vergroten van de expertise van de deelnemende huisartsen. Naar aanleiding van de positieve resultaten van GC-en voor patiënten met orthopaedische klachten was het de vraag of GC-en ook succesvol zouden zijn voor patiënten met hartklachten. Om deze vraag te beantwoorden werd een onderzoeksproject opgezet.

Hoofdstuk 1 betreft een verdere toelichting op de achtergronden van dit project. Ingegaan wordt op de problemen die de huisarts ontmoet als poortwachter van de Nederlandse gezondheidszorg. Een van deze problemen betreft diagnostische onzekerheid die een belangrijke factor is in het besluitvormingsproces van de huisarts. Het bieden van meer diagnostische faciliteiten aan de huisarts lijkt daarvoor geen volledige oplossing te bieden omdat als gevolg daarvan weer vele patiënten onnodig getest zullen worden. Meer dan 40% van alle patiënten worden om diagnostische redenen naar de tweede lijn verwezen. Van alle verwijzingen wordt ongeveer 30% of meer als onnodig beoordeeld. Hiervan zou een aantal voorkomen hebben kunnen worden, wanneer een betere diagnostiek had plaats gevonden.
Opmerkelijk is dat het verwijsproces geen invloed heeft op de specialistische zorg noch op de uitkomst van de verwijzing. Wanneer de huisarts dus een goede poortwachter wil zijn is het van belang om veel aandacht te besteden aan het selectieproces opdat de juiste patiënt verwezen wordt. Huisartsen en specialisten zijn niet goed op de hoogte van elkaars werkwijzen, hetgeen een van de oorzaken is van het grote aantal herhaalverwijzingen in de cardiologie. Substitutie van zorg kan alleen verwezenlijkt worden wanneer een betere afstemming tussen beide disciplines wordt bereikt waarin het complementaire karakter van beider werkwijzen tot zijn recht komt. De hierboven beschreven problemen waren de aanleiding tot het onderzoeksproject 'Het gezamenlijk consult van huisarts en cardioloog in de eerste lijn'.
De doelen van dit project waren: het verkleinen van de diagnostische onzekerheid van de huisarts, het verbeteren van de selectie van patiënten voor

verwijzing naar de tweede lijn en het verbeteren van de samenwerking van huisartsen en cardiologen.
De onderzoeksvraagstellingen waren:

- wat is de aard en kwantiteit van de cardiale problemen waarmee de huisarts in de dagelijkse praktijk mee te maken krijgt en in welke mate wordt het handelen van de huisarts beïnvloed door diagnostische onzekerheid?
- wat zijn de effecten van GC-en van huisartsen en cardiologen op de zorg voor de patiënten en hun gezondheidstoestand, en hoe worden de GC-en door de patiënten gewaardeerd?
- leidt deelname aan GC-sessies tot een kennistoename bij de huisarts?
- welke doelen hebben huisartsen en cardiologen bij deelname aan GC-en, zijn deze gerealiseerd, en welke zijn hun ervaringen?
- in welke mate verschillen patiënten met niet acute hartproblemen die direct worden verwezen van de patiënten die voor GC-en werden geselecteerd?
- wordt door deelname aan GC-en een reductie van het aantal verwijzingen gerealiseerd en leidt dit tot een kostenreductie?
- is het GC van huisarts en specialist een haalbare werkwijze?

In **hoofdstuk 2** wordt de diagnostische onzekerheid bij cardiale problemen in de huisartspraktijk nader belicht. Twaalf procent van alle klachten die aan de huisarts worden gepresenteerd betreffen de tractus circulatorius. In slechts een kwart van deze gevallen wordt een cardiologische ziekte gevonden, terwijl in een kwart tot een derde van de gevallen de diagnose onduidelijk blijft.
De incidentie van cardiologische aandoeningen is tamelijk laag, terwijl de prevalentie hoog is en 12 tot 20% van alle episodes betreft waarbij het in een kwart van de gevallen gaat om hypertensie met vervolgens ischaemische hartziekte, hartfalen en atriumfibrilleren als meest voorkomende aandoeningen. De prevalentie van ischaemische hartziekte kan vergeleken worden met die van diabetes mellitus. Van alle hartpatiënten wordt, afhankelijk van de diagnose, 10 tot 28% verwezen. Het percentage onnodige verwijzingen hiervan is niet bekend. Het verwijspercentage wordt mede bepaald door diagnostische onzekerheid. Geconcludeerd kan worden dat hartproblemen een belangrijk deel van de aan de huisarts aangeboden morbiditeit uitmaken.
De verwachte toename van de prevalentie van chronische hartaandoeningen in de nabije toekomst en hun veelal ongunstige prognose vergt veel van het huisartsgeneeskundig handelen.
Nieuwe vormen van samenwerking tussen huisartsen en cardiologen zoals het

gezamenlijk consult kunnen een bijdrage leveren aan de verbetering van de vaardigheden en expertise van de huisartsen.

De vraagstellingen, het design en de methoden van de gerandomiseerde trial waarin het gezamenlijk consult de interventie was, worden beschreven in **hoofdstuk 3**. De effecten van GC-en worden vergeleken met die van de gebruikelijke zorg zoals die aan de patiënten van een controle groep wordt geboden. In 5 regio's in het zuidoosten van Nederland werd huisartsen en cardiologen de mogelijkheid geboden deel te nemen aan het project. Wanneer de huisarts onzeker was over de diagnose en/of behandeling van een patiënt kon deze geïncludeerd worden. Dat gold ook patiënten die ongerust waren over hun klachten. Geïncludeerde patiënten werden at random toegewezen aan de interventie- dan wel de controlegroep. Daartoe werd een pre-randomisatie design gebruikt met als gevolg dat de patiënten alleen werden geïnformeerd over de randomisatie-arm waaraan ze waren toegewezen. Het pre-randomisatie design was voor de evaluatie van GC-en goedgekeurd door de Medisch Ethische Commissie van het Academisch Ziekenhuis Maastricht. Een overzicht van afhankelijke en onafhankelijke variabelen wordt gegeven als ook een overzicht van de gebruikte vragenlijsten. De interventie periode duurde gemiddeld 1,5 jaar waarin door elke groep regelmatig GC-en werden gehouden. De patiënten van beide groepen werden na een follow-up periode nogmaals gezien in een GC van de eigen huisarts met een cardioloog. Zeventien groepen met in totaal 56 huisartsen startten het onderzoek. Van hen vielen 7 af zodat 49 huisartsen in 16 groepen de studie beëindigden, terwijl 13 cardiologen deelnamen. Het betrof een groep ervaren huisartsen: 75% van hen was 40 jaar of ouder terwijl 66% langer dan 10 jaar als huisarts werkzaam was. Een derde van de huisartsen was werkte in een gezondheidscentrum. Landelijk gezien werkt slechts 10% van de huisartsen in een dergelijke setting.

De resultaten en conclusies van de trial worden gepresenteerd in **hoofdstuk 4** getiteld 'Effectiveness of joint consultation sessions of general practitioners and cardiologists in a primary care setting'.
Patiëntgebonden effectvariabelen waren: de algehele gezondheidstoestand, de mate van welbevinden, het klachtenpatroon na de follow-up periode, de ernst van toestand van de patiënt zoals ingeschat door de cardioloog, de mate van ongerustheid over zijn klachten.
De effectvariabelen met betrekking tot de zorg waren: het aantal aanvullende

onderzoeken door de huisartsen, het aantal verwijzingen naar de polikliniek cardiologie, en wijzigingen in de diagnose die moesten worden aangebracht in de periode tussen het initiële en follow-up consult.
De huisartsen includeerden 396 patiënten. Van 306 waren de gegevens beschikbaar voor analyse: 148 in de interventie- en 158 in de controle groep. Het uitvalpercentage bedroeg 23%. In de interventiegroep stierven meer patiënten dan in de controlegroep, maar er kon in geen van de gevallen een verband worden gelegd met een delay of een tekort in de behandeling als gevolg van het GC.
De leeftijd van de patiënt, diens geslacht en de klinische variabelen toonden een gelijke verdeling over beide groepen, hetgeen ook gold voor de redenen die de huisarts hadden opgegeven om hun patiënten te selecteren. Diagnostische onzekerheid was vaker een reden tot selectie dan therapeutische onzekerheid. Pijn op de borst werd in 24% van de gevallen gepresenteerd, en was daarmee de belangrijkste klachtencategorie. In de interventiegroep werd in 56% van de gevallen de diagnose die de huisarts aanvankelijk had gesteld bevestigd tijdens het GC. De percentages liepen uiteen van 33% voor hartfalen tot 80% van de angina pectoris gevallen. In de interventiegroep werd minder vaak aanvullend onderzoek (te weten een electrocardiogram (ECG) of een röntgenfoto van hart en longen) aangevraagd. De patiënten die aan GC-en deelnamen vonden significant vaker dan de patiënten van de controlegroep dat hun klachten bevredigend waren afgehandeld. Significant meer patiënten van de controlegroep werden verwezen: 52% ten opzichte van 33% in de interventiegroep (inclusief de verwijzingen tijdens de follow-up periode). In de controlegroep moest na de follow-up vaker de diagnose worden bijgesteld.
De verwijspercentages in de praktijken van de deelnemende huisartsen liet een daling zien van 10% vergeleken met de verwijspercentages van de overige huisartsen in de regio's, hetgeen een significant verschil is.
Geconcludeerd wordt dat GC-en van huisartsen en cardiologen leiden tot een kwaliteit van zorg die op zijn minst vergelijkbaar is met de gebruikelijke zorg, ondanks een afname van het aantal aanvullende onderzoeken en een afname van het aantal verwijzingen naar de tweede lijn. GC-en bevorderen de selectie van patiënten die specialistische zorg nodig hebben. De resultaten van GC-en toonden een gelijkaardig patroon voor orthopaedische en cardiologische patiënten. De effecten zouden nog kunnen toenemen wanneer toegang verleend zou worden aan de huisartsen voor aanvullend specialistisch

onderzoek van die patiënten die anders als resultaat van het GC verwezen zouden moeten worden om dat onderzoek te kunnen ondergaan. Het GC is effectiever dan gebruikelijke zorg voor eerste lijns patiënten met hartklachten. Studies naar de effecten bij klachten van andere tracti wordt aanbevolen.

Hoofdstuk 5 getiteld 'Joint consultation as a method for continuing medical education en professional development' betreft een studie naar de nascholings-effecten van het GC.
De veronderstelling was dat deelname aan GC-en de competentie van de huisarts en het huisartsgeneeskundig handelen bevordert. Huisartsen zouden daardoor in staat zijn ook betere zorg te verlenen aan hun patiënten die niet betrokken waren bij GC-en. De GC-werkwijze voldoet aan alle eisen die gesteld kunnen worden aan methoden die tot doel hebben de expertise van de huisartsen te vergroten doordat het een kleinschalige werkwijze betreft die 'dicht bij huis', in de eerste lijn, alledaagse problemen behandelt en die het de huisartsen mogelijk maakt hun werkwijze te toetsen en nieuwe vaardigheden te verwerven in een kleine groep collegae. De vraagstelling voor dit onderzoek was na te gaan of deelname aan GC-en voor patiënten met hartklachten inderdaad de competentie van de huisarts vergroot.
De effecten werden op twee manieren onderzocht. Voor de kwantitatieve methode werd gebruik gemaakt van een kennistoets die was samengesteld uit 50 vragen die waren geselecteerd uit de Nationale Kennis Toets (NKT). Deze toets had een voorspellende waarde ten aanzien van de kwaliteit van het huisartsgeneeskundig handelen, en bestond uit een reeks stellingen over alledaagse huisartsgeneeskundige casuïstiek. De huisartsen werden twee maal aan de toets onderworpen: één maal vóór en één maal na de interventie-periode. De resultaten werden vergeleken met die van een controlegroep huisartsen die de test ook twee maal aflegden.
Daarnaast werd een kwalitatieve methode gebruikt, te weten een semi-gestructureerd interview met een steekproef uit de groep deelnemende huis-artsen over de door hen zelf ervaren toename van kennis, hun veranderingen in het huisartsgeneeskundig handelen en de door hen ingeschatte relevantie van GC-en. De aselect gekozen groep werd verdeeld in drie categorieën afhankelijk van het aantal patiënten dat ieder van hen had geïncludeerd voor de GC-sessies. De kennistoets liet gemiddeld genomen, noch in de interventie, noch in de controlegroep, in geen der regio's significante verschillen zien in de resultaten vóór en na de interventieperiode. In de interviews meldden de

huisartsen dat zij van oordeel waren dat hun kennis was toegenomen. De meesten van hen hadden meer vertrouwen in het eigen huisartsgeneeskundig handelen bij hartklachten, vonden GC-en zinvol voor het dagelijkse werk en waardeerden het uiteindelijke scholingseffect. De kwantitatieve toets die gericht was op 'evidence based' kennis leek niet geschikt om het type kennis te meten dat door GC werd verkregen, te weten 'experience based' kennis. De conclusie luidt dat GC inderdaad de competentie van de huisarts en zijn handelen verbeteren. Het GC lijkt een nuttig instrument bij de 'professional development' een begrip dat meer dan alleen nascholingsaspecten omvat.

Van de ervaringen van de deelnemende huisartsen en cardiologen wordt verslag gedaan in **hoofdstuk 6.** Hiervan hangt mede af of in de toekomst GC-en als een structurele voorziening ten behoeve van de samenwerking kunnen worden aangeboden. Het was dus van belang te weten met welke doelen de huisartsen en cardiologen aan het project begonnen waren en hoe zij hun deelname ervaren hebben. Wat is hun mening over de GC-werkwijze? Om deze meningen te inventariseren werd aan de huisartsen en cardiologen een vragenlijst voorgelegd na de follow-up periode. Van de 56 huisartsen die aanvankelijk gestart waren vulden er 51 de vragenlijst in. Zo ook 9 van de 13 cardiologen.
De meeste huisartsen gaven meerdere doelen aan met als belangrijkste 'nascholing', hetgeen door 96% van de huisartsen werd aangegeven. Voor 85% van hen was deze doelstelling min of meer gehaald. Een tweede door 82% genoemde doelstelling was het 'terugdringen van diagnostische onzekerheid' waaraan naar het oordeel van 87% van hen min of meer was voldaan. Andere doelen waren: 'verbeteren behandelmogelijkheden' door 76% genoemd, behaald in 71%, 'verbeteren samenwerking' door 76% genoemd van wie 69% vond dat het doel gehaald was. Het 'geruststellen van patiënten' werd door 63% genoemd, door 88% gehaald geacht, en 'reductie van het aantal verwijzingen' door 49% genoemd waarvan 56% vond dat dit doel gehaald was. Voor de cardiologen was het 'verbeteren van de samenwerking' het belangrijkste doel dat door allen werd genoemd maar ook behaald. Andere belangrijke doelen voor de cardiologen waren: 'nascholing voor de huisartsen' door 89% genoemd en volgens deze allen gehaald, 'terugdringen diagnostische onzekerheid' door 89% resp.87%, 'het geruststellen van patiënten' door 89% resp.88% en 'reductie van het aantal verwijzingen' door 66% respectievelijk 66%. Alle 148 GC-casus hadden voor de huisartsen enige meerwaarde, in de

meeste gevallen ging het om meer diagnostische of therapeutische zekerheid. Het directe persoonlijke contact van huisarts en cardioloog werd door bijna allen gewaardeerd.
Van alle huisartsen gaf 84% aan dat er soms geen patiënten waren die geschikt waren voor inclusie, en 85% vond dat de randomisatie een maal of vaker een belemmering vormde voor selectie van een patiënt.
De meeste huisartsen en cardiologen hadden een positief oordeel over de GC-en en wilden daarmee doorgaan. Opgemerkt moet worden dat de responderende cardiologen mogelijk een positieve selectie vormden en dat hun niet responderende collegae een minder positief oordeel hadden.
Geconcludeerd kan worden dat de belangrijkste doelen als nascholing en vergroten van de diagnostische zekerheid van de huisarts naar het oordeel van zowel huisartsen als cardiologen min of meer behaald waren. Hoewel het directe persoonlijke contact werd gewaardeerd vonden de huisartsen dat de regionale samenwerking tussen huisartsen en cardiologen niet verbeterd was. Dit kan voor een deel worden verklaard door het gegeven dat in sommige regio's de consulent niet in die regio werkzaam was. GC-en zouden dan ook alleen gehouden moeten worden met consulenten die in dezelfde regio werkzaam zijn als de huisartsen. Het onderzoeksdesign werd ervaren als een belangrijke barrière die tot een sub-optimaal gebruik van de GC-werkwijze en -mogelijkheden heeft geleid. Geadviseerd wordt het GC-systeem breed te implementeren en voort te gaan met het doen van dit type onderzoek om tot een 'evidence based' zorgvernieuwing te komen.

Gedurende het project werd natuurlijk ook een aantal patiënten direct naar de polklinieken verwezen en niet geselecteerd voor het GC. De vraag was in hoeverre de verwezen patiënten verschilden van de groep patiënten die aan GC-en hadden deelgenomen. Daartoe werd een apart deelonderzoek uitgevoerd waarvan in **hoofdstuk 7**, getiteld 'Patients referred to the cardiologist versus patients selected for joint consultation: are there differences?', verslag wordt gedaan. Dit onderzoek werd retrospectief uitgevoerd in de twee grootste regio's van de trial, waarin 11 GC-groepen (69% van het totaal aantal) participeerden. De patiënten die voor het eerst verwezen waren, werden op de poliklinieken van de twee grote ziekenhuizen in die regio's opgespoord. Over de patiënten die daartoe schriftelijk toestemming hadden verleend werd aan hun huisarts een schriftelijke vragenlijst voorgelegd en werd het polikliniek dossier bestudeerd. De verzamelde gegevens betroffen de klachten van de

patiënt, de diagnose die door de cardioloog was gesteld, de reden tot verwijzing en de reden waarom niet tot inclusie voor het GC was besloten. Deze gegevens werden vergeleken met die van patiënten die waren geïncludeerd voor het GC.
Van 129 van de 226 opgespoorde patiënten konden de gegevens worden geanalyseerd. De verwezen groep telde meer mannen en meer oudere patiënten. Het merendeel van de klachten kwam in beide groepen in gelijke mate voor, in de verwezen groep werden deze vaker als ernstig beoordeeld. Bij 36% van de verwezen patiënten werd geen hartziekte gevonden. Van alle patiënten die vanwege pijn op de borst waren verwezen had 56% geen hartziekte volgens de cardioloog.
In beide groepen was diagnostische onzekerheid het belangrijkste motief tot verwijzing respectievelijk inclusie voor het GC. Het percentage patiënten dat is verwezen vanwege ongerustheid is veel hoger dan dat percentage in de GC-groep. Van 23% van de verwezen patiënten vonden de huisartsen achteraf dat zij geselecteerd hadden kunnen worden voor deelname aan het GC. In een derde van deze gevallen was het ontwijken van de randomisatieprocedure de reden tot verwijzing.
Ofschoon de GC-werkwijze een geschikte methode is om patiënten gerust te stellen was ongerustheid van de patiënt vaker de reden tot verwijzing. Geconcludeerd kan worden dat de huisartsen geen optimaal gebruik hebben gemaakt van het GC en dat meer patiënten geïncludeerd hadden kunnen worden. Een grotere reductie van onnodige verwijzingen lijkt haalbaar in een setting waarin geen sprake is van een randomisatie, hetgeen kan resulteren in een groter substitutie-effect.

In **hoofdstuk 8** wordt verslag gedaan van een onderzoek waarin werd nagegaan of de verwijspercentages van de aan de trial deelnemende huisartsen afnam en of een kostenbesparing kon worden gerealiseerd. Van 44 van de 49 deelnemers en van hun collegae in elk van de regio's werden van de twee grootste zorgverzekeraars in die regio's de cardiologische en algemene verwijscijfers verkregen. Het percentage van het aantal cardiologie verwijzingen van het totaal aantal per jaar werd per regio berekend voor de huisartsen van de interventiegroep en voor hun collegae, evenals het proportionele verschil tussen 1994 en 1997. Voor de schatting van de kosten werd het 'Simulatie-model Toekomstanalyse Coronaire Hartziekten' gebruikt omdat het buiten de opzet van de studie lag om een 'echte' kosten effectiviteits-studie te verrichten.

We beperkten de schatting van de kosten tot deze van Coronaire Hartziekten (CHZ) omdat pijn op de borst en CHZ de belangrijkste klacht respectievelijk diagnose categorieën waren in de trial.
Het proportionele verschil tussen interventiegroep en huisartsen in de verschillende regio's was significant. Een gemiddelde reductie van ongeveer 10% van het aantal jaarlijks verwezen patiënten werd gerealiseerd. Een GC-groep bestaande uit 3 huisartsen zal jaarlijks de verwijzing van ongeveer 40 patiënten kunnen voorkomen. Wanneer dit allemaal CHZ-patiënten zou betreffen zou daarmee een besparing van ongeveer 14000 gulden kunnen worden bereikt. De deelname van een consulent aan een reeks GC-en gedurende ongeveer één jaar kan worden begroot op 0.0125 Fte. Daarmee is een honorarium gemoeid van ongeveer 6500 gulden per jaar. Dit bedrag moet worden afgetrokken van het boven genoemde bedrag zodat een netto kostenbesparing van ongeveer 7500 gulden per GC-groep van 3 huisartsen per jaar kan worden bereikt.
Ondanks de methodologische beperkingen die samenhangen met het gebruik van een model dat beperkt was tot CHZ kan voor andere hartaandoeningen waarschijnlijk een zelfde patroon worden gevonden. Verondersteld mag worden dat er een geleidelijke uitdoving van het nascholingseffect van het GC zal optreden zodat verwacht mag worden dat nog enige tijd na het einde van een GC-cyclus verwijzingen kunnen worden voorkomen. Met het oog op de kosten zal er een cumulatieve besparing optreden die hoger is dan de boven berekende zonder extra tijdsinvestering. Het is opmerkelijk dat in de trial waarin de effecten van GC-en bij orthopaedische patiënten werden onderzocht een even grote reductie van het aantal verwijzingen van 10% werd gevonden. Geconcludeerd wordt dan ook dat de GC-werkwijze resulteert in een reductie van het aantal verwijzingen in een mate dat GC-en kosteneffectief zijn.

In **hoofdstuk 9** wordt een implementatieproject beschreven waarin de haalbaarheid en effecten van GC-en georganiseerd in de vorm van een carrousel werden bestudeerd. Deze GC Carrousel maakte deel uit van een Zorgvernieuwingsexperiment van de Ziekenhuizen Noord Limburg waarin 6 specialismen participeerden: cardiologie, orthopaedie, KNO-heelkunde, urologie, dermatologie en pulmonologie. In de Carrousel participeerden verder 9 groepen huisartsen die elk met een specialisme gedurende één jaar een aantal GC-sessies had met de mogelijkheid om na één jaar van specialisme te veranderen. Door de korte looptijd van het project en de geleidelijke instroom

van deelnemende specialisten konden 5 groepen slechts aan één cyclus deelnemen zodat voor hen de carrousel nog niet gerealiseerd kon worden. Vragenlijsten over elke patiënt werden door de eigen huisarts en de patiënt zelf ingevuld. Een half jaar na het GC vulde de huisarts een follow-up vragenlijst in. De huisartsen en specialisten werden schriftelijk geïnterviewd over hun ervaringen.
Er waren meer patiënten met orthopaedische, KNO of huidproblemen geselecteerd dan patiënten met cardiologische, urologische of longproblemen. In totaal meer dan 200 patiënten namen deel. Onzekerheid over diagnose of behandeling waren de belangrijkste redenen tot selectie van de patiënten. In ongeveer een kwart van de gevallen kon een verwijzing worden voorkomen. In de follow-up periode moest in 6 tot 17% van de gevallen de diagnose worden aangepast of gewijzigd, een zelfde percentage patiënten moest alsnog worden verwezen.
De belangrijkste winst voor de huisartsen was meer diagnostische zekerheid. Ze verklaarden zich zekerder te voelen in het dagelijks huisartsgeneeskundig handelen. Vrijwel alle patiënten hadden vertrouwen in de werkwijze.
De deelnemers waren unaniem in hun mening dat GC-en bijdroegen aan een betere samenwerking. Alle specialisten en 88% van de huisartsen bevestigden het nascholingseffect. Deelname aan GC-en leverde voor sommige specialisten capaciteitsproblemen op de polikliniek op.
De conclusie luidt dat de GC Carrousel een haalbare methode is met gelijkaardige resultaten als die van de trials voor patiënten met orthopaedische respectievelijk cardiale problemen.
Een GC Carrousel zou dan ook als regulaire voorziening opgezet moeten worden. Voor de specialisten is het van belang dat hun bijdrage structureel wordt opgenomen in de productie-afspraken die zij met de zorgverzekeraars maken.
De effectiviteit van het GC kan nog op verschillende wijzen verder verbeterd worden.

In **hoofdstuk 10** worden de belangrijkste resultaten en methodologische aspecten van het project in een algemene beschouwing besproken. De relevantie van de bevindingen wordt voorgelegd en aanbevelingen voor de nascholing en verder onderzoek worden gedaan.
Het GC-systeem zou structureel opgezet moeten worden waarbij meer aandacht zou moeten worden besteed aan de belangen van de specialist.

GC-en passen goed binnen 'shared care' modellen, hetgeen zal leiden tot een betere selectie van patiënten die specialistische zorg nodig hebben. GC-en kunnen tevens gebruikt worden om de voorwaarden te bespreken voor terugverwijzing van patiënten van tweede naar eerste lijn. GC-en zouden structureel moeten worden opgenomen op de nascholingsagenda en deelname zou structureel geaccrediteerd moeten worden. Voor een structurele implementatie wordt geadviseerd een permanent GC-bureau in te stellen.
De GC-methode zou beter geïntegreerd moeten worden in de gebruikelijke diagnostische procedures.
Thema's die vaak aan de orde komen zouden moeten worden opgenomen in de regionale nascholingsagenda om de uitstraling van de methode te vergroten.
Verder onderzoek zou gedaan moeten worden naar het GC als methode van nascholing. Daarbij is van belang de verschillen tussen 'evidence based' kennis en 'experience based' kennis nader te bestuderen. Wat is 'experience based' kennis precies, en hoe draagt het GC bij aan een toename daarvan?
Nader onderzoek zou moeten worden verricht om na te gaan of de GC-methode kosten effectief is.
Gezien de grote mate van diagnostische onzekerheid die werd gevonden zou meer aandacht moeten worden besteed aan het diagnostische besluitvormingsproces in een vroege fase van het medische onderwijs.

appendix 1

List of all questionnaires and research instruments used in the joint consultation project and side projects.

1 **trial 'Joint consultation of general practitioners and cardiologists in a primary care setting': chapter 3 and 4**

intervention group:

- Questionnaires for GP:
  - at inclusion of the patient
  - at joint consultation
  - after follow-up period
- Questionnaires for the cardiologist:
  - at joint consultation
  - after follow-up period
- Questionnaires for the patient:
  - at inclusion by the GP, including the Heart Patients Psychological Questionnaire (HPPQ)
  - at joint consultation
  - after follow-up period including the HPPQ

control group:

- Questionnaires for the GP:
  - at inclusion of the patient
  - after joint consultation
- Questionnaire for the cardiologist:
  - after follow-up period
- Questionnaires for the patient:
  - at inclusion including the HPPQ
  - after follow-up period including the HPPQ

2 **study 'Joint consultation as a method of continuing medical education': chapter 5**

- quantitative method: A knowledge test consisting of a selection of 50 questions, about ICPC tracts A, K and R, out of the Dutch National Knowledge Test, completed by the GPs of the intervention group and GPs of a control group

- qualitative method: A semi-structured interview for a random selection of GPs of the intervention group

8 study 'Joint consultation sessions of GPs and cardiologists. Objectives and experiences': chapter 6

- Questionnaire for GPs and cardiologists participating in the project, completed after the follow-up period

4 study 'Patients referred to the cardiologist versus patients selected for joint consultation: are there differences?': chapter 7

- Questionnaire for the GPs of each patient who was traced at the out patient clinics.
- File of the cardiologist of each referred patient
- Data about the patients included for joint consultation from the trial-instruments

5 study 'Decreasing trends in referrals and costs for patients with coronary heart disease as a result of joint consultations': chapter 8

- Data about the cardiological and total referrals by the participating GPs and their colleagues in their districts from 1994 till 1997 included, obtained from the two main health care insurance companies
- To the assessment of costs 'A simulation model for future analysis of coronary heart disease' was used

6 implementation project 'The joint consultation carrousel. From experiment to regular service': chapter 9

- Questionnaires:
  - each selected patient for the GP, the specialist and patient himself
  - about each patient to be completed by the GP after follow-up period
  - for all participating GPs and specialists
- Structured discussion with participating specialists

appendix 2

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Aan hun drieën wordt 'het boekje' opgedragen.

curriculum vitae

Hans Vlek, op 29 juli 1950 in Maastricht geboren, behaalde in 1969 het HBS-B diploma aan het toenmalige Veldeke College te Maastricht. Vervolgens ging hij geneeskunde studeren aan de Katholieke Universiteit Leuven te Leuven, België. De studie werd voortgezet aan de Universiteit van Amsterdam waar hij in 1977 het artsexamen haalde. In 1978 heeft hij enkele maanden als assistent psychiatrie-niet-in-opleiding gewerkt in het Provinciaal Ziekenhuis te Santpoort alvorens de éénjarige huisartsopleiding aan het Huisartseninstituut van de Universiteit van Amsterdam te starten. Martin Kramp in Amsterdam Noord was zijn opleider. Registratie in het huisartsenregister werd verkregen in 1979. Daarna heeft hij één jaar gewerkt als verpleeghuisarts in het verpleeghuis het Zonnehuis te Amstelveen. In augustus 1980 vestigde hij zich als huisarts in het gezondheidscentrum Westzijderveld te Koog aan de Zaan, dat beheerd werd door de Stichting Samenwerkende Kruisverenigingen Zaanstreek. Vanaf 1986 was hij ook hoofd van dat gezondheidscentrum. In 1989 verhuisde hij naar Venlo om zich als huisarts in het academische gezondheidscentrum Withuis te vestigen. Een onderzoek naar de begeleiding door de huisarts van patiënten die een myocardinfarct hebben doorgemaakt werd in 1993 door hem uitgevoerd. Vervolgens startte hij als huisarts-onderzoeker in het onderzoeks-project 'Het gezamenlijk consult huisarts-specialist, toegepast bij cardiologische problemen' dat werd uitgevoerd vanuit de Capaciteitsgroep Huisartsgeneeskunde van de Universiteit Maastricht. Vanaf 1996 was hij lid van het DB Academisering van deze capaciteitsgroep en werkte mee aan de voorbereiding van verschillende workshops voor het academisch netwerk. In Noord Limburg was hij vanaf 1996 projectleider van het project Gezamenlijk Consult Carrousel dat in het kader van het Zorgvernieuwingsexperiment van de ziekenhuizen Noord Limburg, later onder de vlag van het Symfonieproject van het gezondheidscentrum Withuis, werd uitgevoerd. Vanaf november 2000 zal hij werkzaam zijn als medisch coördinator van het Centrum voor Diagnostiek en Consultatie te Helmond.
Hij woont met echtgenote Ellen Marres, zoon Jasper en dochter Susanne te Venlo.